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Summary

Statistics Tasmania

ABOUT THIS RELEASE

Statistics - Tasmania is a statistical snapshot of Tasmania and Tasmanians. It brings together a range of ABS and non-ABS data to provide economic, social and demographic indicators for Tasmania. Included are indicators on population, labour force, education, crime, health, agriculture, housing and construction, transport, income and tourism. Commentary and feature articles complement the statistical data presented.

Geodiversity and biodiversity (Feature Article)

Feature Article - Geodiversity and biodiversity

Feature article published in the Tasmanian Year Book, 2000 (cat. no. 1301.6)

Contributed by Nature Conservation Branch, Department of Primary Industries, Water and Environment

Tasmania, including all its islands, supports a wide variety of landforms, plants and animals. There are approximately 1900 native plant species, 37 native mammals, 159 resident terrestrial species of birds, 21 land reptiles, 11 amphibians and 44 freshwater fish. Isolated from the Australian mainland for at least 10,000 years, Tasmania has both supported the continent's biodiversity by providing a refuge for species that have died out on the mainland, and it has been protected from most of the introduced animal species that have so affected the flora and fauna of mainland Australia. The dingo is absent; the fox has never become established; and feral goats and pigs have restricted Tasmanian distributions. Among introduced species, the feral cat and rabbit are the greatest threats to native populations and their habitat.

GEODIVERSITY

Geodiversity or the diversity of our non-living environment is a prerequisite for biodiversity. For example, Pedra Branca Rock is the only place in the world where the Pedra Branca skink lives. If we allow our waterways, landforms and soils to become degraded then this will

adversely impact on natural diversity. Geoconservation is an essential part of bioconservation, as geodiversity provides the variety of environments and environmental pressures which directly influence biodiversity.

For its size, Tasmania has a large variety of rock types. These are representative of the different geological periods stretching back as far as one billion years. The break-up of the Gondwanic supercontinent has had a major influence on the geological evolution of the State, particularly the final break-up, which resulted in Tasmania taking up its roughly triangular shape by about 20 million years ago.

Other significant events have included a number of glaciations. These played a critical role in moulding the States mountains over the last two million years, but also influenced land-forming processes down to and below sea level, which was about 120 m below the current level, 20,000 years ago.

Perhaps one of Tasmania's most famous geological sites is Macquarie Island. It is a very rare example of a geological feature which occurs far below the ocean surface and the earth's crust. Rocks from the upper mantle are well-exposed on the island, as are basalt lavas which extruded on the sea floor about 10 million years ago. It is for these reasons that the island was nominated and listed as a World Heritage Area in 1997.

FLORA

The loss of native vegetation is widely regarded to be the single most significant threat to biodiversity. Since European settlement in 1803 Tasmania has lost 30% of its original native vegetation. The greatest losses are an estimated 66% of swamp forests, 47% of coastal heathland, 46% of dry forest and woodland, and 40% of grasslands. The percentage decrease is lowest in the vegetation types on the most infertile soils. In the period 1988-94 an average of 10,500 ha were cleared annually (Kirkpatrick and Jenkin 1995).

Reservation is used to protect significant species, communities and habitats. A conservation reserve of world class standard requires 15% of pre-European extent or 60% and 100% of 1996 distribution of specific vegetation communities in the reserve system. For forest communities, these targets are being pursued through the Regional Forest Agreement implementation of the Comprehensive, Adequate and Representative (CAR) reserve system. Targets for non-forest native vegetation will be more accurately determined after the completion of detailed vegetation mapping. In many instances private land is required. The majority of the reservation targets are being met through special covenant agreements with landowners through the Regional Forests Agreement Private Land Reserve Program.

Most of the plant communities with the highest priority for conservation occur in the drier areas of the State, the Midlands and northern slopes and south eastern Tasmania bioregions, where extensive agricultural clearance or settlement has occurred. Over 95% of this land is in private ownership. Of the 50 forest communities mapped throughout Tasmania approximately 25 require some private land to be included into the reserve system. The dry sclerophyll forest/grassy woodlands are especially rare.

WETLANDS

Wetlands are areas permanently or periodically inundated by water where sediments and nutrients accumulate. They form a critical link in many terrestrial and aquatic food webs, and the accumulation of nutrients means that they are highly productive areas. Wetlands support flora and fauna that have evolved to survive in a diverse and changeable environment. Because of their specialised physical adaptations and the isolation of many wetlands, there is a high rate of endemism (species that live only in Tasmania), among these organisms.

Wetlands have an important role in ensuring water quality and controlling flooding.

Agricultural development conducted without prior ecological assessment is the major cause of the decline and degradation of wetlands in Tasmania. Urbanisation is another pressure responsible for the decline in the diversity and complexity of wetlands in Tasmania.

Around 800 wetlands covering 41,546 ha have been studied in Tasmania. Of these, 92 are considered of national importance, with a further 61 considered to be of State significance. Ten are considered to be of international significance and are listed on the RAMSAR Convention on Wetlands.

FAUNA

Since European settlement began in 1803, many changes to the Tasmanian landscape have occurred. Although these changes have benefited some species, some are now threatened with extinction. The demise of the Tasmanian Tiger or Thylacine in 1936, and the lack of concrete evidence for its existence since, should serve as a lesson. The last 100 years has seen the recognition that fauna protection includes not only the rich and diverse vertebrate fauna, but the equally fascinating invertebrate fauna. That recognition has resulted in the listing of 118 threatened invertebrates.

Up to 32 priority vertebrate and invertebrate species are being considered for protection under the private land Comprehensive, Adequate and Representative reserve system. Protection is achieved through a combination of dedicated and informal reserves, and off-reserve management prescriptions. Species include 3 mammals, 4 birds, 5 fish, 4 freshwater crayfish, 6 beetles, 5 snails and 4 other invertebrates, which include a butterfly and 3 velvet worms. Currently, minimum reservation requirements for 20 of these species are being met on public land.

Land clearing and soil degradation have been relatively less in Tasmania than on mainland Australia. Nevertheless, the habitats of much of Tasmania have been altered on a large scale by activities such as agriculture and forestry. Subdivision of land into small to medium-sized blocks for residential development poses a threat to conservation of native fauna in many municipalities. Large areas of native habitat are being divided, and reduced to isolated fragments, too small to sustain viable populations of native animals. Sensitive and careful land planning is needed, coupled with joint co-operative action involving the whole community, to ensure that the needs of native wildlife are met.

Managing Tasmania's environment (Feature Article)

Managing Tasmania's environment

Feature article published in the Tasmanian Year Book, 2000 (cat. no. 1301.6)

Contributed by Bob Davies, a former Senior Policy Officer with the Department of Environment and Land Management

Attitudes to environmental management have changed over the past 30 years. In Tasmania this can be illustrated by briefly tracing the history of three socially divisive resource development issues which polarised the environment-versus- development debate. Lack of transparency in the development approval process, together with public and government frustration over the uncertainty of outcomes, eventually led to a review of environment and

planning laws, and the subsequent development of an integrated resource management and planning system (RMPS). The objective of the RMPS as we move into the next century is to ensure a sustainable future for all Tasmanians. This chapter describes the structures and processes that are now in place for environmental management.

SETTING THE SCENE FOR REFORM

Lake Pedder debate

In 1972, following 12 years of escalating public protest and criticism, Lake Pedder in South West Tasmania was flooded to supply 82 megawatts of electricity for industry. In hindsight this was effectively the end of an era that saw development over-ride environmental values. On the one hand UNESCO had described the lake as 'a unique wilderness of incomparable significance and value', on the other was the continuing government policy of hydro-industrialisation; a policy that involved developing Tasmania's potential hydro-electric power generation to attract resource development industries with offers of large volumes of low-cost electricity. There was a fundamental public clash between the economic growth and efficiency model espoused by government and the Hydro-electric Commission (HEC), and the emerging conservation movement. Such was the depth of the public disquiet over the flooding of Lake Pedder that a Commonwealth Government Committee of Inquiry was established in 1974. The Committee recommended a revision of development approval processes to avoid similar confrontations in the future. These recommendations were ignored by the Tasmanian Government of the day, and further confrontation followed with the HEC's subsequent proposal to dam the Franklin River.

Franklin Dam debate

The 1980's Franklin Dam dispute was again primarily concerned with the environmental management of the South West and the protection of wilderness values. The dispute was to embroil the Labor Government, the HEC and the conservation movement in open confrontation, and was eventually resolved when the Commonwealth Government bought into the debate. It began with the HEC proposing that an integrated hydro-electric power development be built initially involving the damming of the Gordon River below its confluence with the Franklin River, and later damming the Gordon River above its confluence with the Olga River. The environmental cost would have been the destruction of 35% of the remaining South West Wilderness area including significant Huon Pine habitat.

Such was the adverse public feeling about the economic and environmental consequences of this development proposal that 10,000 people took to the streets of Hobart to protest. When a referendum was eventually called on the issue in late November 1981, 45% of the votes cast were informal, including 33% which were endorsed 'no dams'. This precipitated a political dilemma for the State's Labor Government who promptly prorogued parliament for four months and subsequently lost office when an election was called in May 1982. A Liberal Government with a significant majority was returned to office and determined to progress the Gordon-below- Franklin project.

A change of government, however, did not make the dams issue go away. The Commonwealth Government in Canberra had meanwhile applied to the World Heritage Commission for the listing of the threatened area. By October 1982 there was growing antagonism between the State and Commonwealth Liberal Governments over the need for a dam. In some quarters it was thought an equivalent block of power could have been provided by a thermal power station. Amid continuing public protest, in December it was revealed that Australia's nomination of the South West as a World Heritage Area had succeeded. By now there was the prospect of a Federal election in the wind, and the Tasmanian Wilderness Society were actively campaigning on the "no dams" case in

mainland capital cities. This worked to the benefit of the Australian Labor party who were elected to office on 5 March 1983. Nevertheless the Tasmanian government remained intransigent and refused to accept Commonwealth Executive Council approved regulations under the National Parks and Wild Life Act (Cwlth) aimed at halting the Franklin Dam development. The Tasmanian Government took the issue to the High Court, but in June 1983 the court ruled that legislation to stop work on the dam was valid. The Franklin was saved, but at huge political and social cost. The process had divided the Tasmanian community (up to 1,300 people had been arrested during the course of the Wilderness Society's Franklin blockade) and the rift has been slow to heal, a situation prolonged by a new and emerging environmental debate over forestry.

Wesley Vale pulp mill debate

Between March 1988 and March 1989 a conflict over the siting of a \$1 billion kraft pulp mill at Wesley Vale, the disposal of its processing wastes, and the availability of close to 2 million tonnes of pulpwood per year to feed the demands of the plant, took centre political stage. At issue was the transparency of development approval process, opportunity for public scrutiny of economic, social and environmental data, and the adequacy environmental impact assessment process conducted under the provisions of the Environment Protection Act 1973. The overlapping Commonwealth requirements were also of concern, especially for the developers' Noranda of Canada and North Ltd, as the project came under the purview of the Foreign Investment Review Board.

The conservation movement argued that the increase in woodchips needed to feed a pulp mill of the size proposed for Wesley Vale would inevitably lead to a substantial increase in woodchip demand, which in turn had the potential to threaten National Estate and World Heritage forests. But, from a State and Commonwealth government perspective, the mill had the potential to provide employment and attract investment to an area of high regional unemployment. It was also claimed the mill would offer substantial balance of payment benefits to the Australian economy. With such polarised views the stage was once again set for confrontation. Local residents in particular felt threatened by the impact of a rail spur and sulphur dioxide emissions on the local rural economy, and there were further concerns about the risk of organochlorines, in waste water discharges, on the marine environment of Bass Strait. An added disquiet arose about the level of timber royalties to be paid for the wood used by the mill, and what benefits the State would actually gain from the mill's development with substantial profits to flow off-shore.

The basic issue was public access to information about the project, site selection, the adequacy of the environmental impact assessment conducted by the company, the role of the company in influencing or manipulating government policy, and timber availability. Matters began to come to a head with Government proposals to fast-track the development and limit opportunities for public comment. Normal public appeal processes under environment and planning legislation were to be by-passed. The media of the time reporting 'that the only people who would make use of such provisions would be the anti-development Greenies'.

Government and the companies (Noranda and North Forests) were at pains to stress that the project would eliminate any need for Ministerial exemptions under the Environment Protection Act 1973 (exemptions had previously allowed businesses and others who were unable to meet discharge standards freedom from prosecution under the regulatory provisions of the Act). And further, that the company would spend \$100m on pollution control measures. The final analysis being that the proposed development offered considerable benefits to the community as a whole so substantial as to more than offset the limited range of adverse effects that might result.

In January 1989 State Parliament was recalled to debate the Department of Environment's guidelines for the environmental management plan. There was strong public criticism of the guidelines, a situation fuelled by a comment by the Director of the Department to Cabinet that the mill was a 'chemical plant rather than a pulp mill'. Parliament, however, approved the guidelines but the companies requested further negotiation. They subsequently issued an ultimatum that unless the guidelines were reconsidered the agreement to development would be terminated. The Minister for Environment then threatened to resign if the guidelines were weakened. Interpretation of the guidelines led to more public disquiet and street rallies on a scale similar to those associated with the protests over the Franklin Dam. When the Tasmanian Government passed The Northern Pulp Mill (Doubts Removal) Agreement 1989 the final decision on the future of the project lay with the Commonwealth Government.

While these matters were being debated and disputed at a State level, the Commonwealth Department of Environment had begun its assessment of the project for the Commonwealth Foreign Investment Review Board. This process helped to flush out the fact that the mill would release a quantity of dioxin in liquid wastes discharged into Bass Strait. Then, unexpectedly, the Commonwealth Minister for Primary Industries announced that the Commonwealth would conduct its own scientific assessment of the environmental effects of the mill because of his concern for the risks to the Australian export markets from dioxins or other chemical effluent. The evaluation concluded that the environmental impact statement (EIS) was grossly inadequate and was critical of the Tasmanian Government's Northern Pulp Mill (Doubts Removal) Agreement. On the 15 March 1989, the Commonwealth Cabinet decided that it was unable to recommend that the Foreign Investment Review Board approve the project. While the economic benefits of the project were recognised the environmental conditions set by Cabinet were in the wider national interest and should be met.

At this point the companies responded that they could not afford continued expenditure without a guarantee that approval for the project would finally be granted, and cancelled the project.

The need for change

As can be seen from these three examples, the planning and development approval process had failed to deliver outcomes which met the needs of Government for investment or increased employment; developers for certainty of process; or indeed the wider community. These failings had led to deep community division; concern for the transparency and adequacy of impact assessment processes; and, had given investors a negative impression of the difficulty of doing business in Tasmania. The Tasmanian Government had not heeded the recommendations of the 1974 Federal Government Inquiry into the flooding of Lake Pedder, or other commentators who, over the years, had also called for legislative reform. However, by the late 1980s concern for the environment and the sustainability of past practices had become mainstream political and social issues. This change in community values was misread by the Government of the day. Thus, when an election was called by Premier Robin Gray in May 1989 the Liberal party lost office to the Green Independents and a reformist Labor Party which were more in tune with the changed community attitudes. The Labor-Green Accord, while short lived, heralded sweeping reforms affecting the processes of Government and the approach to environmental management.

In the May 1989 election 17 Liberal, 13 Labor and 5 Green Independent candidates were elected to the House of Assembly. The five Green Independents combined with the Labor Party to give the Labor Party government, and the arrangement was formalised through the Tasmanian Parliamentary Accord. The Accord committed both parties to work towards common objectives. A significant component of the reform agenda included proposals for

broad and sweeping change to environmental management practices. However, Labor recognised that environmental protection was a complex and difficult issue, and would require a comprehensive overhaul of administrative systems. An early commitment was to put industry on notice that ministerial exemptions were to be phased out over a period of five years.

An integrated approach to sustainable development

With the decision to set a deadline on exemptions there was a further commitment to update environment and planning laws. With the recent experience in Tasmania of failed development projects, development control was recognised as a critical issue and, in the community consultation process that followed, industry and conservation interests indicated general dissatisfaction with the duplicate development approval processes that were in place. Since no one liked the fact that planning decisions were taken in isolation from environmental concerns, and that objections to separate appeal bodies failed to result in holistic appraisal of development proposals, there was much common ground. Following extensive community consultation, and the release of a number of public discussion papers prepared by the then Policy Division of the Department of Environment and Planning, both industry and conservation interests were unanimous in agreeing that there was scope for bringing the two approval systems together. The pressure for this change of approach was not government initiated. Responding to calls for integration, government bureaucrats drafted proposals that took into account these community based views and advised government of a possible legislative framework. The result is now outlined in brief, but not before some brief comment is made about a significant change in political circumstance.

The Labor-Green Accord disintegrated because of differing views over the question of resource security for the forest-based industries. Tensions among the Accord partners had run high in the latter months of 1990 and an election was called for the new year. The election of a Liberal majority government early in 1991 changed the complexion of the legislative reform agenda. Under the Liberal administration there was a much stronger emphasis on development, and this was reflected in the hierarchy of legislation introduced. The point to stress, however, is that the suite of legislation introduced retained the fundamental objective of encouraging developments that were sustainable. While the administrative structures established were much different from those proposed under Labor, many of the environment and planning instruments, such as the objectives of the new laws together with transparent environmental impact assessment processes, common enforcement and appeal processes, were retained.

LEGISLATION

State Policies and Projects Act 1997 (Tas)

The first of the Bills to be introduced and passed by Parliament was the State Policies and Projects Act 1997. It has four primary functions. First, the legislation provides the umbrella framework for implementing legally enforceable statewide policies for such matters as coastal protection and water quality management. All planning schemes controlling land use administered by local government are obliged to abide by these planning policies. The second function is to prescribe the development approval pathway and assessment process for projects of State significance that have the potential to impact across the Tasmanian economy. The Resource Planning and Development Commission has been given the responsibility under the legislation (amended in 1997) for managing the assessment of economic, social and environmental effects of such projects. The Commission also has the responsibility for recommending to Government whether the proposal should be approved and with what development conditions attached. Government is the decision maker, but can only accept or reject the recommendations of the Commission.

The third function of the State Policies and Projects Act is to provide for State of the Environment Reporting. The purpose of such reports is to take a snap shot over time of changing environmental conditions, and to feed this information back into decision making processes. The reports look at the effects of human activity on the environment, as well as the implications for human health, the status of ecosystems, and economic well being. Over time the SOE reports will become a long term strategic planning tool which will encourage the targeting of scarce resources to priority, or emerging, environmental problems. The reports are produced every five years with the first Tasmanian report published in 1996. Finally, but importantly, the Act introduces and defines the important concept of sustainable development which is the core objective of the resource management and planning system. All decision makers are obliged to further this objective in administering the legislation, and further, the Crown is bound.

As stated in the legislation the objectives of the resource management and planning system are:

- to promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity;
- to provide for fair, orderly and sustainable use and development of air, land and water;
- to encourage public involvement in resource management and planning;
- to facilitate economic development in accordance with the preceding objectives; and,
- to promote the sharing of responsibility for resource management and planning between the different spheres of Government, the community and industry in the State.

In the objectives, 'sustainable development' means managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural well-being and for their health and safety while:

- sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations;
- safeguarding the life-supporting capacity of air, water, soil and ecosystems; and
- avoiding, remedying or mitigating any adverse effects on the environment.

The objectives signal that decisions on the use or exploitation of resources needs to take into account the wider economic, social and environmental consequences of development activity. The emphasis has changed from where development is located to how use or development occurs, and what the effects of development might be. Consideration needs to be given to the long term consequences by:

- noting the wider social implications of decisions;
- thinking about future generations;
- planning for the conservation of biodiversity through the protection of habitat, species, and genetic diversity;
- erring on the side of caution (or taking a precautionary approach); and,

- ensuring the efficient use of resources.

This new emphasis comes about because many past practices have been unsustainable leading to, for example, declining water quality in river systems such as the Derwent and Tamar, and unacceptable air pollution in cities such as Launceston. At the extreme species have become extinct, for example, the demise of the Tasmanian Tiger.

Land Use Planning Approvals Act 1993

Since many environmental concerns in the past have arisen from land use planning decisions, the Land Use Planning Approvals Act was introduced to control development through the use of planning schemes. Planning schemes are administered by local government, use common planning principals, and take account of the sustainable development objectives of the law. The Act prescribes the time lines for development approvals together with a uniform set of environmental impact assessment (EIA) principles. Developments that accord with the requirements of a planning scheme, and are a permitted activity, can usually be approved within 42 days. The legislation also provides for the Director of Environmental management to call in a proposal in circumstances where there is a perceived environmental risk.

In the event that there are objections to a development proposal, there is provision for hearings before the Resource Management and Planning Appeal Tribunal. The Tribunal was established by legislation to hear objections on their merit, and not on points of law. A developer can appeal the conditions of a development permit, and the public can appeal on planning, environmental or questions of a project's capacity to operate sustainably. In addition, the tribunal has a civil enforcement function under the Environmental Management and Pollution Control Act (EMPCA), and can issue orders for securing compliance with environment or planning requirements.

Environmental Management and Pollution Control Act 1994 (EMPCA) (Tas)

EMPCA completed the suite of legislation and was introduced in May 1994. It replaced the dated Environment Protection Act 1973, with its command and control approach to regulatory enforcement, with a new generation of environmental management and enforcement tools. These comprise incentives for industry to go beyond regulatory standards by providing for reduced taxes and permit fees to encourage excellence. Environmental audits are also encouraged, and there are mandatory provisions for industry to negotiate environmental improvement programs. These provide a mechanism for securing compliance with regulatory standards over a specified time frame of not more than three years. Failure to meet the conditions of such a program can attract penalties. The public can appeal the terms.

A more flexible approach to enforcement is also provided by the Act. There are environment protection notices, civil enforcement remedies, and a series of tiered penalties which, at the extreme, include goal terms and million dollar fines for corporate executives. These significant penalties are for what might be considered acts of environmental vandalism resulting in serious environmental harm; a concept underpinning the enforcement provisions of the legislation. The term Environmental harm is defined and has a specific meaning at law.

Lastly, EMPCA details the principles of the environmental impact assessment (EIA) process found in the State Policies and Projects Act, and the Land Use Planning and Approvals legislation. These principles are applied in the assessment of all development projects. Activities listed in a Schedule to the Act are subject to what has become known as level two

assessments, and the assessment is made by the Environmental Management Division of the Department of Primary Industry, Water and Environment. The local authority considers compliance with planning requirements. At the end of the approval process the proponent obtains a consolidated development permit with both planning and environmental conditions attached. No longer do investors have to face multiple approval or appeal processes in Tasmania.

NATIONAL AND INTERNATIONAL OBLIGATIONS

While Tasmania has relatively sophisticated legislation for the protection of the environment approaches to environmental management are still evolving. International treaty obligations also have to be factored in. Australia is signatory to over 90 environmental agreements the most notable of which relate to climate change, World Heritage, protection of wetlands and endangered species, marine pollution and biodiversity. And, on 16 July 1999 Commonwealth Parliament paved the way for further discussions with the States with the passage of the Environment Protection and Biodiversity Conservation Act. While at the time of writing the Act has still to be proclaimed, bi-lateral negotiations will have to be entered into with each of the States and territories to accredit the State's environmental laws. Under these agreements, the Commonwealth basically delegates to the States and Territories responsibility for EIA. The exceptions are six and will be reviewed every five years:

- World Heritage Properties;
- Internationally protected migratory species and whales;
- Nationally threatened species;
- Commonwealth marine areas;
- RAMSAR wetlands; and,
- Nuclear activities.

Even in these situations where the Commonwealth can intervene, delegation to the States for impact assessment, and scrutiny of activities for potential environmental harm or damage, is still possible. Fundamentally, the aim is to achieve a greater degree of harmonisation between Commonwealth and State processes, particularly with respect to environmental impact assessment procedures and the trigger mechanisms that will require certain types of project to be assessed. The legislation should reduce, if not eliminate, the duplication between State and Commonwealth processes in major project assessment. For the moment there is an element of uncertainty within industry about the extent and reach of this new legislation.

THE FUTURE

Outside the realm of environmental legislation, there are also a raft of other management tools which have the potential to deliver more sustainable environmental management practices. These include formalised environmental management systems such as international management standard ISO14 001. New corporations law is also starting to have an effect. Section 299(I), Corporations Law, requires businesses operating under certain environmental permits and licenses to produce public environmental reports. National guidelines for these reports are under development. The detail of what is required in an environmental report is at the moment not clear, but should be viewed as part of a wider process requiring enterprises to demonstrate 'due diligence'. Tasmanian firms are not immune from these trends. The connections are not always made between business

efficiency and improved environmental outcomes. But pollution and environmental harm frequently result from waste discharged to either air, land, or water. Most people intuitively know that waste is bad, and in business waste costs money. Looked at in this light, improved environmental management and business efficiency are complementary. This understanding has implications for the State's 'green image'.

Tasmania's native orchids (Feature Article)

Feature Article - Tasmania's native orchids

Feature article published in the Tasmanian Year Book, 2000 (cat. no. 1301.6)

Contributed by Hans Wapstra, Department of Primary Industries, Water and Environment

With 195 species, the orchids are a substantial family in the Tasmanian flora. About one third of them are endemic to the State, and close to half the endemics are rare or threatened. Many of the species we share with other south-eastern Australian States are also in a precarious position.

All but two of our orchids are terrestrial. The richest orchid habitats are dry sclerophyll woodlands and open forests, especially those on sandy soils with heathy and grassy understorey, coastal heathlands and native grasslands. Most orchids flower in spring to early summer, but any month of the year has at least one or two species in flower.

Until the early 1990s orchids were a little known group to all but a handful of specialists, mostly amateur botanists. Unlike most other vascular plants, orchids flower for just a few weeks, in some species only two or three days. The leaves of non-flowering plants are above ground for many months but are hidden among other vegetation, and in any case, are of little help in identifying the species. In addition there have been numerous taxonomic problems. For instance, plants known as the common spider orchid had been a botanical 'catch-all' for at least half a dozen species for well over a century, most of them very rare and with a restricted distribution. With all these difficulties, it is not surprising that orchids rarely appeared by name in botanical surveys, and that most information on abundance or rarity was fragmented.

This has now changed. Since 1992 systematic taxonomic studies and field surveys have been in progress. A comprehensive revision of the Tasmanian orchid flora was published in 1998 and included the recognition and formal description of nearly fifty new species. No less than twenty have been discovered since 1995 which were not just new in the taxonomic sense but species never seen before. In 1999 the book *The Orchids of Tasmania* was published, marking a turning point for Tasmanian orchid studies. The book has new identification keys, descriptions, distribution maps and colour photographs of every known species, enabling professional and amateur botanists to comprehend all our known species.

Perhaps the most exiting discoveries were on a golf course in the Midlands, where in one spring season three endangered orchids were found. One of these was the Gaping Leek Orchid (*Prasophyllum correctum*) previously known from one small and highly threatened colony in Victoria. Thousands of thriving plants were discovered in the golf course rough as a result of a wayward golf ball. The other two are the Pungent Leek Orchid (*Prasophyllum olidum*), an entirely new orchid with an overpowering smell, and the Black-tipped Spider Orchid (*Caladenia anthracina*), a native grassland species known from just a few plants in

four Midland localities. Management measures by the golf club are now an excellent example of how landowners can contribute to conservation of rare plants or habitats.

Remnant native grasslands and grassy woodlands, like the Midlands golf course, are a haven for a large number of threatened plants, including about 20 orchids. Some of these are currently known from just one or two localities, and often only a handful of plants. Almost half of the native grasslands present at the time of settlement have disappeared, most of them in more recent times due to pasture conversion and improvement, by ploughing, application of fertilisers and sowing with introduced pasture species. Orchids in particular have been very sensitive to the use of fertilisers, which are taken up preferentially to levels toxic to the plants.

Effective management of rare habitats and species will increasingly rely on the understanding and goodwill of landowners.

Feral goats in Tasmania (Feature Article)

Feature Article - Feral goats in Tasmania

Feature article published in the Tasmanian Year Book, 1998 (cat. no. 1301.6)

Goats have been a familiar, but minor, element of the agricultural landscape in Tasmania for over 150 years. A study of feral goats in Tasmania by the Parks and Wildlife Service (Atkinson et al. 1995) has shown that feral goats are more widespread and abundant than previously realised. Goats can outcompete other browsing livestock for food and shelter, and can act as vectors for diseases. They are also known to have damaged newly-established forestry plantations. Selective browsing and grazing can change the composition of plant communities dramatically. They eat plants down to ground level, and often uproot them. They can also prevent regeneration of canopy trees by eating the seedlings. Soil erosion is often caused, or exacerbated, by the feeding habits of feral goats and by trampling, particularly at locations where vegetation is sensitive to disturbance.

There have been 136 feral goat herds recorded from a wide range of habitats from sea level to the Central Plateau, in all areas except the cold, wet south-western region. Most herds will range across multiple land tenures, however 46% of herds occurred primarily on private land, including private forests, 23% were mainly in State forests, 20% spent most of their time on reserved land (World Heritage Area, national parks and other reserves) and 11% on unallocated Crown land.

A Parks and Wildlife Service control program for feral goats commenced in 1992. Whilst mustering has been employed, control has mainly been by free shooting. In the three years to mid-1995, feral goat herds had been reduced by 40%. While the greatest reduction in goat numbers has been in the north, nearly 50% of herds remain in the northern and north-eastern areas. Approximately 80 herds, consisting of around 1500 individuals are estimated to remain.

Kings Lomatia (Feature Article)

Feature Article - Kings Lomatia

Feature article published in the Tasmanian Year Book, 1998 (cat. no. 1301.6)

Contributed by Jayne Balmer, Botanist, Tasmanian Parks and Wildlife Service

Kings Lomatia (*Lomatia tasmanica*), formerly called Kings Holly, is an unusual shrub that grows along creek banks in the cool, dense, rainforest of Tasmania's remote Wilderness World Heritage Area. It is one of many Tasmanian endemic plants that helped to have the area listed as World Heritage.

Kings Lomatia was discovered by the miner and naturalist Denny King. Described and named in the 1960s, it is a member of the Proteaceae family. A spindly, straggling plant growing up to five metres tall, Kings Lomatia has attractive leaves forming whorls at the branch ends. Typical of other Proteaceae, it has clusters of rusty red flowers which resemble those of its relative, the grevillea. The plant does not appear to be able to produce seed, and is only able to regenerate itself by vegetative means, sending out long root stems from which new trunks arise.

Extensive searches have revealed that Kings Lomatia is naturally restricted to one small water catchment. There are only about 500 individuals and the area they inhabit is at risk from disease and fire, making the species vulnerable to extinction. The rarity of this plant has perplexed scientists.

The Parks and Wildlife Service has been co-ordinating research on the plant to assist with its long term conservation management within the World Heritage Area. Funds from the Australian Flora Foundation assisted with propagation research at the University of Tasmania. The Royal Tasmanian Botanical Gardens now have a propagation program, with the aim of making the plant commercially available to the public.

Genetic work undertaken at the University of Tasmania showed that there was absolutely no genetic variation within the population. Even plants separated by more than a kilometre were identical. The entire population is composed of a single plant clone. A study of the plant's chromosomes revealed that Kings Lomatia is triploid, that is, it has three sets of chromosomes instead of two. Because of this it is unable to sexually reproduce. The plant is a rare freak of nature whose origins and age are as yet unknown.

It is now believed that this plant clone is the oldest known clone in the world. Radiocarbon dating of a charcoal sample found in the same sedimentary layer as a fossilized leaf of Kings Lomatia suggests that it has been around for at least 43,600 years. Whilst no genetic tests were done on the fossil leaf-which would prove that the two plants are indeed clones-the fossil and modern leaves have the same shape and epidermal cell structure. If the ancient plant were not a triploid these would look different. In comparison, a sterile, vegetatively reproducing, triploid cannot undergo any genetic variation.

This discovery is fascinating because it shows that even without the flexibility of genetic variation some plants are able to tolerate change. Kings Lomatia has lived through the major climatic change at the end of the last glacial, and survived the arrival of people in Tasmania.

Rabbit Calicivirus in Tasmania (Feature Article)

Feature Article - Rabbit Calicivirus in Tasmania

Feature article published in the Tasmanian Year Book, 1998 (cat. no. 1301.6)

The European rabbit is one of Australia's worst vertebrate pests. Previous attempts at biological control of this species-using the myxoma virus-have been only temporarily successful. In 1980 the rabbit calicivirus-another rabbit-specific pathogen-was brought to Australia for evaluation as a control method. In October 1995, during field testing, the virus escaped from the quarantine station on Wardang Island to mainland South Australia.

After spreading rapidly, the presence of calicivirus in Tasmania was confirmed in early January 1997. It is thought that infected insects introduced the virus to the State at some time in either late winter or spring 1996. First detected at Meander in the central north, the disease spread during the summer and autumn east to Perth and west to Lorinna at an average rate of about 3 km per week. North-south spread was limited, probably reflecting the prevailing wind patterns. In much of the infected area, rabbit numbers plummeted and were still very low in August 1997, although there was some reinvasion around the edges from uninfected rabbits.

Two other small outbreaks were also detected later, one near Rocky Cape and the other east of the Tamar River. These may have spread either from the first outbreak or have been separate introductions from the mainland.

Approval to actively spread calicivirus was given by the Minister for Primary Industry and Fisheries on April 23rd 1997. The first release was made one week later at a site on South Arm peninsula where rabbit numbers had been monitored for several months. With its dry climate and sandy soils, this area supports the densest rabbit populations in Tasmania. Due to low winter-time insect population, the virus spread slowly from the infection site covering a radius of approximately 1 km within 2 months. Within 3 months 75% of the rabbits near the release site had died. The virus was released at a number of other sites in southern and north-western Tasmania during winter 1997.

These winter releases were made partly to study the survival of calicivirus in Tasmania's winter conditions and partly to try to ensure a supply of virus in the environment to allow rapid spread when conditions become favourable in spring.

Tasmanian State of Environment report (Feature Article)

Feature Article - Tasmanian State of Environment report

Feature article published in the Tasmanian Year Book, 1996 (cat. no. 1301.6)

The Sustainable Development Advisory Council (SDAC) was created under the State Policies and Projects Act 1993. Under the Act, SDAC became Tasmania's principal body responsible for sustainable development policies, projects of State significance, and State of Environment (SoE) reporting. It is a distinct body of the State Government, though for practical and administrative purposes SDAC shares resources from time to time with the Department of Environment and Land Management.

Preparation of the Report commenced in mid-1994. Publication is planned for the first half of 1996 and will be the first to be produced under the auspices of the Tasmanian Government. Further SoE Reports are planned at approximately five-yearly intervals.

Other Australian SoE reports have been published in the ACT (1994), NSW (1993), South Australia (1993), Western Australia (1992), and Victoria (1991).

The Tasmanian SoE Report will contain three parts. In Part 1, there will be chapters on:

- climate;
- air quality;
- inland waters (surface waters and groundwater);
- land resources;
- biological diversity and habitat;
- human settlements;
- coastal, estuarine and marine environment; and
- cultural heritage.

In Part 2, environmental impacts, pressures and management responses will be considered.

Finally, in Part 3, appropriate actions, based on sustainability criteria, will be recommended.

The following principles have been adopted for the Tasmanian SoE Report:

- rigour-the best available scientific information, methods and advice will be used;
- objectivity-information is to be presented without bias or modification;
- cooperation-partnerships will be encouraged to facilitate the sharing of information, expertise and resources;
- openness-the most relevant and up-to-date information about the environment will be used;
- sustainability-the principles of sustainable development will underpin relevant parts of the SoE Report;
- precautionary principle-that if there is insufficient information to indicate that a process or development is not harmful, then the process or development ought to not to occur;
- maintenance of biological diversity; and
- meeting client needs-identifying and responding to the information required.

Reference groups, responsible for drafting specialised information on topics in Part 1, were constituted in 1994. They have been noteworthy for the diversity of the background and experience of their members. Some are from Tasmanian Government agencies (including Environment and Land Management, and Primary Industry and Fisheries); others are from the University of Tasmania, industry, and private environmental consultancies.

SDAC hopes that the Tasmanian SoE Report will become an authoritative reference tool for

students, environmental practitioners, community groups, parliaments, industry, government departments, and the general community in the years ahead.

Weeds (Feature Article)

Feature Article - Weeds

Feature article published in the Tasmanian Year Book, 1996 (cat. no. 1301.6)

WHAT IS A WEED

Broadly speaking, a weed is a plant growing where it is not wanted. However, a more useful definition of a weed is a plant which interferes with human activities or which may intrude upon or genetically contaminate indigenous vegetation.

In the past, weeds have been viewed as problems for mainly farmers and home gardeners. However, there is a growing recognition that weeds cause problems elsewhere as indicated by the following:

- Pampas Grass and Blackberry are serious weeds of plantation forestry;
- Cumbungi and Parrot's Feather can block drainage and irrigation channels;
- ivy is a known cause of dermatitis;
- hemlock can poison animals and humans;
- willow trees alter river flows, change water environments and reduce access for fishing;
- toe-toe and broom are reducing the conservation value of the Southwest World Heritage Area;
- Japanese Kelp is invading marine eco-systems on the east coast of Tasmania;
- gorse is invasive of roadside strips, reducing the quality and extent of habitat for Tasmania's native plants, birds and animals. These roadside strips contain roadside flora, and provide important migratory routes for some bird species and other native fauna;
- interbreeding between plant species chosen for their ornamental value, and Tasmania's indigenous species could threaten the genetic integrity of the latter, for example interbreeding of *Eucalyptus globulus* 'compacta' and the indigenous *E. globulus*.

DEGRADATION

In many instances, weeds are a symptom of land or environmental degradation. For example:

- thistles may grow densely in pasture after desirable species have been weakened or

eliminated by drought, insect damage or overgrazing; and

- aquatic weeds may build up in dams and streams when artificial nutrients from fertilised pastures or dairy effluent contaminate the water. In these situations, remediation would focus on eliminating the cause or causes, rather than the symptom, the weed itself.

In these situations, remediation would focus on eliminating the cause or causes, rather than the symptom, the weed itself.

THE ECONOMIC COST OF WEEDS IN TASMANIA

An accurate estimate of the cost of weeds would include such things as the cost of weed control and the loss of primary production caused by weeds. Ideally it would also include the less tangible costs such as the loss of aesthetic and conservation values due to weeds or weed control measures.

An April 1994 estimate of the cost of weed control and loss of primary production was \$33 million per annum in Tasmania. This estimate has been used as part of the Tasmanian Weed Management Strategy to help focus attention on the magnitude of the problem.

TASMANIAN WEED MANAGEMENT STRATEGY

The Tasmanian Government has established a Working Group to develop a strategic plan to increase the effectiveness of weed management in the State.

The Tasmanian Weed Management Strategy has been addressing existing and potential weed problems of major significance to primary industry, trade, human welfare, amenity, and biodiversity.

The Strategy covers weeds of all terrestrial and aquatic ecosystems in which plants may invade and/or have significant detrimental effects.

LEGISLATIVE ASPECTS OF WEED CONTROL

The Noxious Weeds Act 1964 (Tas.) empowers the Government to make land holders and occupiers control certain weeds. The Seeds Act 1985 (Tas.) aims to reduce the spread of certain weeds through contamination of agricultural seeds. The Fisheries Act 1959 (Tas.) controls the removal of marine weeds, such as Japanese Kelp. Other Acts that impact on weeds are the Biological Control Act 1986 (Tas.) and the Pesticides Act 1968 (Tas.). All of the above Acts are administered by the Department of Primary Industry and Fisheries.

The following exotic weeds have been declared noxious under the Noxious Weeds Act:

- *Acroptilon repens* (Creeping Knapweed)
- *Asphodelus fistulosus* (Onion Weed)
- *Berkheya rigida* (African Thistle)
- *Carduus nutans* (Nodding Thistle)
- *Carthamus lanatus* (Saffron Thistle)
- *Cenchrus incertus* (Spiny Burrgrass)

- *Cenchrus longispinus* (Spiny Burrgrass)
- *Chondrilla juncea* (Skeleton Weed)
- *Cynara cardunculus* (Artichoke Thistle)
- *Emex australis* (Spiny Emex)
- *Equisetum* spp. (Horsetail)
- *Homeria* spp. (Cape Tulips)
- *Nassella trichotoma* (Serrated Tussock)
- *Onopordum* spp. (Onopordum Thistles)
- *Opuntia aurantiaca* (Tiger Pear)
- *Parthenium hysterophorus* (Parthenium Weed)
- *Pennisetum macrourum* (African Feathergrass)
- *Solanum elaeagnifolium* (Silver-leaf Nightshade)
- *Stipa caudata* (Espartillo)
- *Xanthium* spp. (Burrs)

Historically, weeds legislation has been aimed mainly at agriculture; however, several of the weeds listed above cause little if any direct detriment to agriculture. This policy reflects the current view that weeds legislation has relevance beyond agriculture.

Current Tasmanian Government policy recognises that weeds legislation has limited value in encouraging land owners to adopt long-term weed management strategies which can be achieved more effectively through community participation, such as Landcare.

TRAINING AND MANAGEMENT

Proper weed management requires the understanding of broad ecological concepts, as well as the knowledge of weed control methods. For example, the long-term control of thistles or capeweed in pastures is achieved more appropriately by encouraging competition from perennial pasture species rather than by use of herbicides.

Land managers must be able to obtain such information readily. Training must be available, adequately resourced and aimed at all people involved in weed management including operators of agricultural machinery and earth-moving equipment, landscape designers, nursery operators, and plant breeders.

Currently, bodies such as TAFE, the Tasmanian Rural Industry Training Board, the Department of Primary Industry and Fisheries (Whole Farm Planning Courses) and the Agriculture and Veterinary Chemicals Association (Avicare) provide training in weed identification, management and control for farmers, agribusiness and others.

The Endemic birds of Tasmania (Feature Article)

Feature Article - The Endemic birds of Tasmania

Feature article published in the Tasmanian Year Book, 1972 (cat. no. 1301.6)

The following article was contributed by Mr D. G. Thomas, President, Bird Observers' Association of Tasmania.

INTRODUCTION

In common with most islands Tasmania has an impoverished birdlife (avifauna) with only fifteen species of birds being endemic i.e. exclusively breeding in Tasmania, and a further twenty-six subspecies recognised as island races of continental species. Of 176 land and fresh-water birds breeding in Victoria in habitats similar to those found in Tasmania, only 104, or 59 per cent, also breed in this State. The reasons for this are not fully understood, but are more likely to be associated with ecological factors within Tasmania than with any inability to cross Bass Strait.

Birds which have differentiated sufficiently to be regarded as species different from their closest relatives are usually thought to have been the earliest colonists. Those species in which island populations cannot be distinguished from mainland birds are usually considered to be the most recent arrivals. A subspecies is intermediate between the two but recent evidence has shown that an isolated population may develop into a new subspecies within a few generations. In view of this, the accepted theory may have to be reconsidered but when discussing the endemic birds of Tasmania, the chronological concept is still a useful working hypothesis.

It should be pointed out that opinions differ as to the dividing line between species and subspecies. Some Tasmanian birds which were once regarded as being endemic are now thought to be subspecies of more widely distributed species. For example, the Tasmanian Masked Owl is now regarded as being a subspecies of the mainland Masked Owls.

Throughout this article both the English and Latin names are those used in the *Official Checklist of the Birds of Australia* published in 1926 by the Royal Australasian Ornithologists Union. The vernacular names used in various parts of the State may differ from 'official' usage. In the interests of clarity, 'official' names have been retained and it is hoped that they will become more generally used.

CLIMATE AND HABITAT

Introduction

The distribution of birds is determined by their habitat and food preferences. Tasmanian habitats can be divided roughly into two categories, depending on the tolerance of the vegetation to temperature and rainfall.

Cold-wet adapted habitats occur over much of the western half of the State, with isolated pockets at Ben Lomond, Mount Elephant, eastern Tasman Peninsula and South Bruny Island. Warm-dry adapted habitats occupy the rest of the State and Flinders, King and Maria Islands.

The distribution of vegetation was very different at the height of the last glaciation during the

Pleistocene epoch which occurred about 18,000 years ago. During this period Tasmania was part of the Australian continent. With the enormous amount of water locked-up in the icecaps, the sea-level fell to such an extent that Tasmania was connected to Victoria by a land-bridge through the Furneaux group of islands; King and Maria Islands were also connected to Tasmania. Elsewhere, the steeply sloping continental shelf would have resulted in a seaward extension of the land surface of up to 15 miles. Only small amounts of the present warm-dry habitats would probably have existed.

From 18,000 years ago the climate warmed-up and the sea-level rose, progressively separating Flinders Island from Victoria, King and Maria Islands from Tasmania and finally severing the Tasmania-Flinders Island link.

During the last 6,000 or so years in which the Victoria-Flinders Island land-bridge existed, the extent of warm-dry habitats would have increased, the species spreading south as the temperature rose.

Cold-Wet Habitats

The present-day cold-wet adapted habitats comprise:

Temperate Rain Forest: Dominated by the Antarctic Beech, *Nothofagus cunninghami*, which occurs from sea-level to 3,000 feet where annual rainfall exceeds 45 inches. Within this area occur wet gullies where the dominant vegetation is tree ferns and mosses.

Sub-Alpine Forest: Occurs from 3,000 feet to the tree-line. The dominant tree is the Snow Gum, *Eucalyptus coccifera*, and there is a rich shrub-layer which includes the deciduous Beech, *Nothofagus gunnii*.

High Moors: Occurring from 3,000 feet upwards, the dominant species are Snow Grass, *Poa Coespitosa*, on the better drained soils and Pineapple Grass, *Astelia alpina*, in less well-drained sites.

Wet Sedgeland: Better known as 'Button Grass Plains'; occurring from sea-level to 3,000 feet. Button Grass, *Mesomelaena sphaerocephala*, is the dominant plant, often forming almost pure stands.

Warm-Dry Habitats

The warm-dry habitats consist of:

Low-Altitude Heath: Occurs on deep sandy soils, mainly in coastal areas.

Savannah Woodland: Occurs mainly in the Midlands where the rainfall is less than 22 inches and consisted originally of native grasses and scattered eucalypts. Large areas of native grasses have been replaced by improved pasture.

Dry Sclerophyll Forest: The dominant formation over much of eastern Tasmania, where the yearly rainfall is 22-30 inches. It is made up mainly of eucalypts, the species depending on rainfall, drainage, soil, altitude and aspect.

Wet Sclerophyll Forest: Occurs in areas with a rainfall of 30-50 inches. It consists of tall eucalypts with a tree under-storey or well-developed shrub layer.

The above reconstruction of the history of the vegetation and habitat classification is after Ridpath and Moreau (1966). It is of interest because it might be expected that the endemic

birds would be associated with the cold-wet habitats which are thought to have been in existence for at least 18,000 years.

ENDEMIC SPECIES

Tribonyx mortierii (Native Hen)

This large flightless bird is generally greenish-brown in colour with a conspicuous white mark on its flanks. It is common near water throughout eastern Tasmania and is regarded officially as a 'pest species' because of the damage it is supposed to do to crops. This aspect has been studied by Ridpath and Meldrum (1967 a, b) who concluded that wide-spread control campaigns are neither necessary nor desirable. Flightless species such as *T. mortierii* and other species confined to islands are particularly vulnerable and many have become extinct.

Platycercus caledonicus (Green Rosella)

This bird varies a great deal in the brilliance of its plumage which is dark green with yellow breast and red forehead. It is a very widespread species appearing in most forested areas and is by no means restricted to cold-wet habitats.

Lathamus discolor (Swift Parrot)

Mainly green in colour with red forehead, shoulders, throat and tail, the Swift Parrot is confined to the warm-dry habitats. It is migratory, spending the winter as far north as Queensland, an unusual habit for an island endemic. However, the Swift Parrot is not known to breed on the mainland.

Petroica vittata (Dusky Robin)

The sexes are indistinguishable in the field, both males and females retaining dull brown immature plumage. In other Tasmanian robins the male has black or slate upperparts and is red or pink on the underparts.

It typically occurs on the edges of forest or light scrub, with the greatest numbers appearing in the eastern parts of the State, and only sparingly in the cold-wet habitats, e.g. Lake Pedder.

Acanthiza ewingii (Tasmanian Thornbill)

A small bird, light brown with white flanks and under-tail. The Tasmanian Thornbill occurs in cold-wet habitats. With the Brown Thornbill, *A. pusilla*, it represents a double invasion of Tasmania by birds derived from a common stock. Although the two are similar in appearance, the Tasmanian Thornbill has differentiated more from mainland forms and is regarded as a full species. The Brown Thornbill has differentiated only at a subspecies level which suggests it was later reaching Tasmania. This is substantiated by distinct habitat variations.

Acanthornis magnus (Scrub Tit)

Generally olive-brown with a white throat. The Scrub Tit forms a monotypic genus. It is restricted to habitats with a distinctive endemic vegetation (wet fern gullies) belonging to the cold-wet formations, suggesting that it has been in Tasmania for a very long time. This restriction to a particular habitat also suggests that it is a relict species that once had more widespread distribution. According to Ridpath and Moreau it is the only species that can be

considered with any certainty to have been present in Tasmania during the last glaciation.

Sericornis humilis (Brown Scrub-Wren)

The Brown Scrub-Wren is deep brown in colour with a white spot on the edge of the wing. It occurs in thick cover close to the ground and is most numerous in the cold-wet habitats. Commonly found in wet sclerophyll forest, it occurs sparingly in dry sclerophyll forest.

Further research will probably show that the Brown Scrub-Wren is in fact not a distinct species but a large subspecies of the mainland Whitebrowed Scrub-Wren, *S. frontalis*.

Pardalotus striatus (Yellow-tipped Pardalote)

P. striatus, also known as the Striated Pardalote, is grey with a white streaked black head and an orange-yellow bright spot on the wing. It is restricted to warm-dry habitats. Like the Swift Parrot, the Yellow-tipped Pardalote migrates to the mainland, although a few birds may winter in Tasmania.

P. quadragintus (Forty-spotted Pardalote)

Slightly larger than the Yellow-tipped Pardalote, the Forty-spotted Pardalote retains the juvenile plumage, being grey and olive-green with a yellow face. Known only to exist in warm-dry habitats at five localities - Flinders Island, Maria Island, Saltwater River, Tinderbox and North Bruny Island - the Forty-spotted Pardalote is the least numerous of the Tasmanian endemics. It is believed the total population does not exceed 1,000 individuals and that the species is close to extinction.

Melithreptus validirostris (Strong-billed Honeyeater)

Brownish-olive with a white crescent on a black neck, this honeyeater occurs in both dry and wet sclerophyll forests, particularly in the latter, where ever there are tall rough-barked trees. It obtains much insect food from the tree bark, a habit reminiscent of mainland tree-creeping birds which do not occur in Tasmania. In winter it forms noisy nomadic flocks.

M. affinis (Black-headed Honeyeater)

This bird is similar in appearance to the Strong-billed Honeyeater from which it can be distinguished by the absence of white on the back of the neck. Mainly a bird of the warm-dry habitats it forages among the foliage. Like the Strong-billed Honeyeater it forms nomadic winter flocks, at times entering suburban areas.

Meliphaga flavicollis (Yellow-throated Honeyeater)

The Yellow-throated Honeyeater is green with a yellow throat. It is very common in all forested areas and is another species that has adopted the bark-feeding habit to some extent. Pairs tend to remain in the same area throughout the year although a few birds, probably young birds, spend the winter in suburban areas.

Authochaera paradoxa (Yellow Wattlebird)

The largest of all Australian honeyeaters, the Yellow Wattlebird is yellowish-brown with yellow wattles (comb). It breeds in dry and wet sclerophyll forests. Outside the breeding season it is nomadic following the blossoming of the various eucalypts and also coming into suburban gardens; large numbers congregate in east coast orchards. The Yellow Wattlebird is a succulent game bird and in most years there is an open season lasting a few days.

Strepera fuliginosa (Black Currawong)

Also known as the Black Jay, this bird is black with white tips and edges to its wings. It predominantly occurs in cold-wet formations and only sparingly throughout the dry sclerophyll forests of the Eastern Tiers. The Black Currawong can become remarkably tame, a characteristic often noted by visitors to Mount Field National Park or Waldheim.

S. arguta (Clinking Currawong)

A uniform dark grey in colour with white-edged and tipped tail. The Clinking Currawong (Black Magpie) is restricted to the warm-dry habitats of the eastern part of the State, being particularly plentiful in the low-altitude heaths of the north-east.

ENDEMIC SUBSPECIES

Dromaius novaehollandiae (Emu)

Reputed to be common in early settlement days, this flightless bird is now extinct. It must have arrived in Tasmania before the land bridge disappeared.

Synoicus australis (Brown Quail)

The Brown Quail has brown plumage with darker spots. A game bird, it is restricted to warm-dry habitats, low-altitude heath, savannah woodland and dry sclerophyll forest.

Rallus pectoralis (Lewin Water Rail)

Dark brown with black and white streaks. Rails and crakes are a difficult study in the field, being rarely seen denizens of reed-beds and marshes. As a result, the distribution of the Water Rail in Tasmania has not yet been established.

Aquila audax (Wedge-tailed Eagle)

Blackish-brown in colour, the Wedge-tailed Eagle is common in suitable localities although Sharland (1958) estimated that there were probably only 100 birds in Tasmania. As each pair has a home range of many square miles these magnificent birds can often be seen soaring and gliding in places as far apart as Cape Portland, the Hazards, Mount Olympus and even Knocklofty (a foothill of Mount Wellington). The Wedge-tailed Eagle is fully protected in Tasmania despite claims that it often kills lambs. It is by no means certain that the eagle kills healthy lambs although it will take weak, dying and dead animals. This is being investigated by the C.S.I.R.O. in Western Australia.

Ninox novaeseelandiae (Spotted Owl)

Sometimes called the Boobook or Morepork Owl, the Spotted Owl is dark brown with white spots. As with other owls it is rarely seen in daylight when it hides in hollow trees or thick scrub in the dry sclerophyll forest or around homesteads and towns where it also occurs. At night its call, 'morepork', is a familiar sound of the bush.

Tyto novaehollandiae (Masked Owl)

Easily distinguished by its buff or chestnut coloured facial disk (white in mainland birds), the Masked Owl has a blackish-brown body spotted with white. It normally occurs in dry sclerophyll forest although it has been recorded in wet sclerophyll forest.

Platycercus eximius (Eastern Rosella)

Strikingly coloured with red, blue and green plumage, the Eastern Rosella has a very restricted distribution. Common only in savannah woodland, orchards and cultivated pastures it is confined to the eastern parts of the State and unknown in cold habitats. Elsewhere it has been replaced by the endemic Green Rosella to which it is closely related and with which it has been known to interbreed.

Pezoporus wallicus (Ground Parrot)

Bright green in colour with yellow spots. The Ground Parrot is found in the south-west where it inhabits the Button Grass Plains and coastal heath. Elsewhere it should be looked for in coastal heath although it is less common there than it once was because frequent burning of the heath has given rise to vegetation too sparse for its requirements. Tasmania is the stronghold of this rarely seen bird, the presence of which is best detected at dusk and dawn when, for a few minutes, it calls. The call is a plaintive low whistle of several distinct notes of ascending scale.

Podargus strigoides (Tawny Frogmouth)

During the day the Tawny Frogmouth remains motionless on its perch being very hard to detect with its camouflaging plumage of dappled brown and grey. Confined to the warmer habitats, it is common in the more open dry sclerophyll forests. It is insectivorous, hunting at dusk and during the night.

Aegotheles cristata (Owlet-Nightjar)

Blackish-grey in colour, the Owlet-Nightjar like the Tawny Frogmouth, is a nocturnal insect hunter. Its distribution is also similar. Although common it is less well-known, hiding in hollow trees during the day.

Rhipidura fuliginosa (Grey Fantail)

Grey and black with white outer tail feathers this well-known bird, also called the 'Cranky Fan', is widely distributed in a variety of habitats. It is a partial migrant to the mainland, with some birds remaining in Tasmania throughout winter when they become nomadic.

Pachycephala pectoralis (Golden Whistler)

The Golden Whistler has black and white plumage, the male having a yellow breast. In Tasmania it is common in both dry and wet sclerophyll forests but in many parts of south-eastern Australia it is found in the wetter habitats.

Colluricincla harmonica (Grey Shrike-Thrush)

Grey in colour as the name indicates, the Shrike-Thrush is a very well-known bird occurring in a wide range of habitats. In this State it searches the bark and branches of trees for insects, a habit it has not developed on the mainland.

Coracina novaehollandiae (Black-faced Cuckoo-Shrike)

This bird has smoke-grey plumage with a black face and throat. It is most common in dry sclerophyll forest. Few birds winter in Tasmania, the majority migrating to the mainland.

Cinclosoma punctatum (Spotted Quail-Thrush)

Mainly brown and grey with a long white-tipped tail. The Spotted Quail-Thrush occurs in the warmer habitats and is perhaps the only bird in Tasmania that is restricted to dry sclerophyll forest.

Epthianura albifrons (White-fronted Chat)

This quite common bird, with black and white plumage, appears to fill the 'wagtail' niche in Tasmania. It is common on river-flats and marshes but also occurs in poor, dry grassland provided some cover is available. Apparently the Chat has increased in numbers since 1880. The nature of its movements is not known but it does appear to move about to some extent.

Acanthiza pusilla (Brown Thornbill)

The Brown Thornbill is brown in colour with a black streaked breast. It is restricted to the warm-dry habitats. *A. pusilla* has differentiated only subspecifically from the mainland forms; however, with *A. ewingii* (Tasmanian Thornbill) it represents a double invasion of Tasmania by birds of the same stock. The Tasmanian Thornbill has differentiated sufficiently to be regarded as a separate species.

Megalurus gramineus (Little Grassbird)

The Little Grassbird, with its body a streaked brown colour, is camouflaged perfectly for its reed-bed habitat. It is uncommon mainly because of the lack of suitable habitat.

Stipiturus malachurus (Southern Emu Wren)

The Southern Emu Wren has brown plumage, the male also having a blue throat. Its habitat is patches of scrub surrounded by Button Grass although it does occur in reed beds. The Emu Wren is one of the few endemic subspecies that is restricted to the western part of the State.

Zosterops lateralis (Grey-breasted Silver Eye)

Green with a white-ringed eye, this bird breeds in many habitats, most commonly in low-altitude heath and wet sclerophyll forest. Outside the breeding season many birds migrate to the mainland while others form flocks which remain in Tasmania, moving wherever food is available.

Gliciphila melanops (Tawny-crowned Honeyeater)

The Tawny-crowned honeyeater is a dull grey-brown with a light crown. It is restricted to coastal heath.

Acanthorhynchus tenuirostris (Eastern Spinebill)

Mainly reddish-brown in colour, the Eastern Spinebill is a common breeding species in low-altitude heath. It is one of the few Tasmanian honeyeaters that relies heavily on nectar and has a long, curved thin bill particularly well suited to extracting nectar from tubular flowers. In winter it is nomadic, being common in dry sclerophyll forest, feeding on the heath *Epacris impressa*.

Myzantha melanocephala (Noisy Miner)

With a grey plumage and black crown the Noisy Miner is common in savannah woodland, orchards and cultivated pastures. The bird has a similar distribution to that of the Eastern Rosella occurring in colonies consisting of a breeding male and female with several non-breeding helpers which assist in feeding the young.

Corvus tasmanicus (Raven)

A large all-black bird often called a crow, the Raven occurs in a wide range of habitats in Tasmania. The Australian corvids classification has been revised recently and the only one that occurs in this State is the Forest Raven. Apparently one race occurs in Tasmania, the Otway Ranges and Wilsons Promontory and a second race in the New England tablelands, so perhaps the Tasmanian bird should no longer be considered an endemic subspecies. Its distribution is interesting, suggesting it is a relict species that was once more widespread.

Cracticus torquatus (Grey Butcherbird)

Generally black with grey upperparts, it is restricted to dry sclerophyll forests and habitats associated with man. A meat eater, the Grey Butcherbird will sometimes destroy small caged birds and will also catch Sparrows, Goldfinches and similar birds.

Gymnorhina hypoleuca (White-backed Magpie)

The White-backed Magpie is easily recognised with its strongly contrasting black and white plumage. It is a common bird that sometimes lives in large groups which have a single breeding pair and has a distribution similar to that of the Eastern Rosella and Noisy Miner. As the Tasmanian birds are so much smaller than those found on the mainland, some researchers regard the Magpie as distinct at the specific level. Once more widespread, it currently appears to be extending its range.

SUMMARY

Of the fifteen endemic species only two (Tasmanian Thornbill and Scrub-Tit) occur exclusively in the cold-wet formations although two others, Brown Scrub-Wren and Black Currawong, are most numerous in these habitats. As far as the endemic subspecies are concerned only the Southern Emu Wren is restricted to these 'older' formations, although the Wedge-tailed Eagle and Ground Parrot are common.

Undoubtedly dry sclerophyll forests have the greatest number of common breeding species.

Because a greater proportion of endemic species than subspecies is found in the cold-wet formations, support is lent to the idea that these were the first to reach Tasmania. Ridpath and Moreau (1966) concluded that only one species, the Scrub-Tit, could with certainty have been present 18,000 years ago when the last glaciation was at its height. However, the evidence was inconclusive for the Tasmanian Thornbill and the Forty-spotted Pardalote.

The remaining species entered Tasmania some time after the height of the glaciation, many probably arriving across the land-bridge i.e. over 12,000 years ago.

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The Marsupials of Tasmania (Feature Article)

Feature Article - The Marsupials of Tasmania

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Mammals and Marsupials

The Sub-Classes of Mammals

Mammalia was the term invented by Linnaeus in 1758 to include that class of animals in which the young are brought forth alive and nourished with milk from the mother's breasts. At this point of time, two mammalian sub-classes were known, the first including man, monkeys, dogs, whales, cows, etc. and the second the marsupials, their existence having been established in 1500 by the Pinzons when they took a Brazilian opossum back to Granada. The discoverers of Australia then slowly expanded the coverage of the marsupial sub-class by reporting kangaroos, wombats, bandicoots, 'opossums' and the wolf-like thylacine.

The Australian continent was also the home of the platypus and the echidna with the result that a third mammalian sub-class had to be formed, these egg-producing creatures satisfying other mammalian criteria (which had now been expanded beyond the mere mechanics of reproduction).

Tasmanian Mammals

Tasmania's indigenous fauna provides examples of all three mammalian sub-classes:

(i) Prototheria, represented by *Ornithorhynchus anatinus* (platypus) and *Tachyglossus setosus* (an endemic species of echidna);

(ii) Metatheria, represented by 19 species of marsupials of which seven are endemic;

(iii) Eutheria, represented by 5 species of native rodents and six species of bats. An important distinction between Tasmania and continental Australia is the absence, in this island, of two eutherian predators: the dingo, widespread in Australia when the first white settlers arrived, and the fox, introduced by the settlers there in the nineteenth century.

Marsupial Characteristics

The term marsupial is applied, in general, to animals which, after bearing young in an immature state of development, suckle the offspring in a pouch. Thus the young of

marsupials, from conception, may be traced through two stages: (i) gestation; (ii) pouch life; in the case of the Tasmanian devil, for example, gestation is about 31 days and the pouch life about 4½ months.

In the larger marsupials, for example the kangaroo, the new-born are small and poorly developed, except for the fore-limbs which are proportionately very large and tipped with strong claws; the hind legs at this stage may be only embryonic buds. The young are about an inch in length, naked of fur, blind and with ears hardly visible. The female kangaroo, at parturition, sits with her tail brought forward between her legs and spends some of her time scratching at her pouch and licking it. When the offspring emerges from the cloaca, it climbs by its clawed fore-limbs into the pouch and reaches the teats, one of which it eventually fastens to with its mouth.

The tip of the teat expands within the mouth so that the young kangaroo cannot be released without rupturing the sides of its mouth and, for a start, the body grows without any corresponding increase in the size of the mouth. The end of the offspring's pouch life draws near when it is freed from the teat; it then begins to eat vegetation by leaning from the pouch when the mother herself is feeding.

The pouch itself exhibits considerable variety, opening downward or backward in some marsupials, or forward or upwards in others; the kangaroos, for example, which rest in a sitting position, have pouches opening upward.

The period of dependency of offspring does not necessarily end when the young leave the pouch. For example, young bandicoots live on in the mother's nest until they are able to look after themselves.

Isolation from Mainland

About 30,000 years ago, a great increase in the volume of world ice caused shorelines to fall hundreds of feet below their existing level. Eventually the melting of this ice reversed the process and a slow, great flooding began, one result being the formation of Bass Strait and the isolation of Tasmania as an island. By interpolation on recently published curves for world sea level changes, this event dates back about 11,000 years.

Because of this land link in comparatively recent times (in terms of the geological time scale), it is not surprising that Tasmania should have few endemic marsupials. The two most quoted examples are the Tasmanian tiger and the Tasmanian devil (*Thylacinus cynocephalus* and *Sarcophilus harrisii*) but allied species are known to have lived in continental Australia, despite the fact that they were extinct there before white settlement began. It is true that, putting aside the tiger and the devil, there are five other endemic marsupial species but these are closely related to corresponding continental species. All Tasmanian marsupials are indigenous with one exception; the exotic species is the sugar glider or flying possum, *Petaurus breviceps*, Victorian specimens having been brought to the island in the period 1835-1837 as pets, only to escape and take to the bush.

Arrangement of Species

The pouched mice, native cats, Tasmanian tigers and Tasmanian devils all belong to the family Dasyuridae, a group of the superfamily Dasyuroidea. However, the grouping of the Tasmanian marsupial species in the sections that follow is not made in conformity with any scientific principle but is based, in the main, on the common names of the animals (e.g. 'possum' as a heading covering five species, the nexus being the fact that the common name of each contains the word possum).

The Major Carnivores

(1) *Thylacinus cynocephalus*

The Tasmanian Tiger apparently earned this title from the 13-18 stripes on the rump but the animal is much more akin to a very large dog or a wolf if an analogy must be sought. The tail is long, rigid and slightly compressed laterally. Thylacines of up to six feet total length have been known.

Thylacines are carnivorous animals and naturally turned to sheep killing in the days of early settlement; from 1888 the government paid a bounty of \$2 per head for them and they were vigorously hunted up to the turn of the century. From about 1914 the species became very rare whilst today, for all practical purposes, the animal is extinct. Reported sightings still are investigated from time to time and the discovery of pad marks and other evidence have revived hope that the species may still exist; for many years now, however, no capture has been made. To most Tasmanians, the tiger is only a picture in a book but some of the older generation had the opportunity of seeing live specimens in a Hobart zoo in the 1920s.

(2) *Sarcophilus harrisii*

The early settlers were unable to adequately compare this animal with anything in their experience and therefore coined the name Tasmanian Devil; the head, equipped with massively strong jaws, is large and broad at the base and this makes the hind quarters appear relatively weak and out of proportion. The devil is black with white chest, shoulder and rump markings although occasionally all-black specimens are found.

Unlike thylacine, the devil is still very common, particularly on the west coast and in the north-east, and is spreading into other areas where it had not been seen in living memory. The animal is carnivorous and not fastidious, so in disposing of prey or carrion it eats the lot - skin, fur or feathers, and intestines; its sight is better adapted to night hunting and is defective in daylight.

March is the main breeding month and three or four young are born after a gestation period of about 31 days. The offspring are then reared in the pouch for about 4-5 months. It has been observed that, in captivity, the male eats the young; possibly in the natural state, the male is driven from the den when offspring are being reared.

(3) *Dasyurus maculatus*

Tiger Cat is not a happy choice of name for this animal; the head is most 'uncatlike', resembling more that of a weasel or similar species and its characteristic spots, on body and tail, are most 'untigerlike'. Possibly the tiger prefix is a tribute to the creature's reputation as a courageous and fierce fighter. Specimens of up to four feet in length have been recorded; the animal is usually dark brown in colour although black varieties are common. It is a good tree climber and can therefore rifle birds' nests but it preys also on small mammals and reptiles, with poultry yards as occasional targets.

The main mating months are June-July, with gestation lasting about three weeks. The tiger cat's pouch contains six nipples in which four to six offspring are reared for a further three months. The species is widely distributed in the eastern States from mid-coastal Queensland to Tasmania; within the island, it is widespread but not as common as the native cat.

(4) *Dasyurus quoll*

The Native Cat (*D. quoll*) has a spotted body but not a spotted tail, and this is the easiest way of distinguishing it from the Tiger Cat (*D. maculatus*); in general, it is smaller and less fierce than the latter. Specimens range in colour from sandy through olive-grey to black, but the lighter spots are always present.

The main breeding months are from late May to early August and 20 to 25 embryos may be born, of which only six have a chance of living by attaching themselves to nipples within the pouch. The species is widespread in the eastern States from N.S.W. to Tasmania; it occurs also on King Island.

Possums

(5) Trichosurus vulpecula

The Brush Possum is not so exclusively arboreal as the ringtail and spends some of its time on the ground. Its long, bushy, prehensile tail has the inner surface naked at the end and this helps distinguish it from the ringtail which has a tail covered by short hair and marked by a prominent white tip. In general, brush possums are larger than ringtails and range in colour from grizzled grey through rufous brown to black, the underside being invariably lighter; the black specimens are usually found in the wetter parts of the island. Cream or silver colouring has occasionally been recorded.

The female breeds twice a year, March and August being the main months, and the gestation period is 16 to 21 days. Since the offspring, usually one or sometimes two, remain in the pouch for five months, female brush possums taken at any time of the year are likely to be carrying young. The species is widespread throughout Tasmania and found also in eastern Australia.

(6) Pseudocheirus convolutor

The Ringtail Possum can be distinguished from the brush possum by its tail (see previous section), and varies in colour from dark grey to dark brown or even black. More strictly arboreal than the brush possum, it is widespread in Tasmania but is thought to suffer severely from natural population cycles; the numbers fell off greatly about 1951-52 and have been slow to recover. The ringtail lives in most types of country except plains and possibly rain forest. Eucalypt leaves and young shoots form the main item of food; if it raids an orchard, the ringtail will attack young shoots.

Young are found in the pouch during most months of the year, but especially in winter. Gestation may result in the birth of as many as six young but only two can survive (the pouch contains four teats but only two are functional). The species is found also in the Bass Strait islands but not on the mainland of Australia; however, a related species lives there.

Ringtail and brush possums are hunted for their skins but are partially protected by short game seasons (or total prohibition for a year or series of years, as for the ringtail). Other species given the name possum are described in the following sections.

(7) Cercaetus nanus

The Pigmy Possum (*C. nanus*) is less than six inches in body length and is hard to distinguish from an allied species, *C. lepida*. The ears of *nanus* are broader and larger, and *lepida* is the smaller in body length, the snout-rump length being less than three inches. One peculiarity of both species is a swelling of the tail at the base, especially in autumn, due to the deposition of fat.

The pigmy possum makes a nest in the bark of trees and lives on nectar, blossom and insects; it hibernates for a period in winter. The species occurs also in the eastern States as far north as south-east Queensland and in S.A. but little is known of its Tasmanian distribution; Tasmanian specimens have been recorded at Cullenswood in the north-east and Franklin in the south.

(8) *Cercaertus lepida*

The Little Tasmanian Pigmy Possum (*C. lepida*), on superficial examination, appears to be a diminutive of *C. namus* but there is sufficient differentiation to label it as a separate species. Specimens have been caught in places as widely separated as Tyenna and Port Davey in the south and near Launceston in the north. The species is confined to Tasmania.

(9) *Petaurus brevicaps*

The Sugar Glider, often called the flying possum, is readily distinguished by the beautiful, soft, dove grey fur and by the presence of the gliding membrane which runs down the side of the body. The tail is long and bushy with a dark tip. A dark stripe runs along the head and down the back. The species is not a native of Tasmania and was introduced from Port Phillip into the north by travellers who had made pets of the creatures in the period 1835-1837.

The creature lives on insects, fruits, buds and blossoms, and the female bears two offspring each season, usually in June or July. It is now widely distributed in Tasmania and is found in the eastern States of Australia, and even in the Northern Territory.

Pouched Mice

(10) *Antechinus swainsonii*

The Dusky Marsupial Mouse is dark brown in colour with a lighter belly; it has small ears and white on its tail which is hairy and almost as long as the body. The relation of tail to crown-rump length establishes the distinction between *A. swainsonii* and *A. minimus*; in the former species, the tail is shorter than this length, in the latter, longer. The snout-rump length is known to be as great as six inches in *A. swainsonii*.

Eight or nine young are born in July or August and are carried in an incomplete pouch for some seven to eight weeks; the offspring then commence nest life when their eyes open and their fur has developed. The species has been recorded at Maydena, Orford, Nietta, Lake St Clair, Dromedary and Sandy Bay but, due to its habits, it is rarely encountered. There are two races of this species, the one confined to Tasmania and the other occurring in the highlands of Victoria and N.S.W. The mainland race has thinner fur and the underside is dark brown with a red-yellow tinge.

(11) *Antechinus minimus*

The Little Tasmanian Marsupial Mouse can be distinguished from *A. swainsonii* by the tail relationship described in the previous section; in general, *A. minimus* is a smaller species and is characterised by a blunter face. The species is confined to Tasmania and the Bass Strait islands.

(12) *Sminthopsis leucopus*

The Whitefooted Sminthopsis has a very sharply pointed snout, white feet and a white and hairy tail, tufted at the tip. The body is dark grey to black, but the snout and ears are fawn

colour. The species is rarely encountered but is distributed in the eastern States from Victoria to south Queensland; recent specimens have been recorded at Hawley in northern Tasmania and at Orford in the east.

Bandicoots

(13) *Perameles gunnii*

The Barred Bandicoot is easily recognised by having four or five dark bars across the rump; the tail is short, the snout long and the ears are almost rabbit-like. The colour is light whitish fawn, the bars are dark brown and the tail and undersurface near white. The animal lives in open country and lightly timbered areas in nests constructed in grass tussocks; its main food is vegetable matter and insects.

Three or four young may be born at any time of the year and the pouch has eight teats. The period of immaturity is spent first in the pouch and later in the nest. The species is widely distributed in Tasmania in suitable country but is not found in continental Australia; it closely resembles a mainland species, the eastern barred bandicoot, *P. fasciata*.

(14) *Isodon obesulus*

The Short-nosed Bandicoot is usually light brown, coarse-haired and near white underneath; the tail is short, thinly furred and somewhat scaly. The absence of dark bars on the rump easily distinguishes it from *Perameles gunnii*.

This animal tends to live in thick scrub country where it makes a nest of twigs, leaves and earth to blend with the surroundings; it is mainly an insect eater and digs after its prey. It is a hopper, rather than a walker, moving both hind feet simultaneously and is chiefly nocturnal in habit.

The main breeding season is in June and July, with four offspring as the usual outcome. The pouch has eight nipples and the young, after leaving the pouch, live on in the nest. The short-nosed bandicoot is widely distributed not only in Tasmania but also in the eastern States.

Wallabies and Kangaroos

(15) *Wallabia rufogrisea*

Bennett's Wallaby has a long face and long ears; the tips of the ears and the end of the snout are dark. The usual colour is reddish brown with a grey undersurface, though grey and dark individuals are common. The back is often greyish. This species can be distinguished from the pademelon (*Thylogale billardierii*) by the foot length: between 150 and 250 mm in the wallaby, but under 150 mm in the pademelon; another difference is that the pademelon's face and ears are much shorter and the snout blunter.

Bennett's Wallaby inhabits relatively open country (when compared with the pademelon which prefers the thicker scrubs) and is often wrongly called a kangaroo. The main breeding months are January and February, gestation lasting about 40 days. One young is usually carried though twins are not uncommon and triplets have been recorded. Life in the pouch is very prolonged and the young do not leave it before November or December. The species is very widely distributed in Tasmania in open savannah woodlands, coastal scrub, sclerophyll forest and on the fringes of pastoral clearings. A species of the same name (*W. rufogrisea*) is found in continental Australia but the mainland wallaby is larger in size and has a shorter coat. The Tasmanian animal is sometimes referred to as *W. r. bennetti*.

(16) *Thylogale billardierii*

The Pademelon is usually called a wallaby but the previous section gives the way of distinguishing it from a true wallaby; its colour can be one of many shades of brown, with dark reddish brown the most common. The ventral surface tends to be yellow-brown or reddish.

Breeding takes place in the summer but young may be found in the pouch throughout the year; only one young is usually carried. The animal is widespread in Tasmania, preferring the thicker lower scrubs for its habitat.

(17) *Macropus giganteus tasmaniensis*

Tasmania has only one species of kangaroo, the Forester Kangaroo, and it can easily be distinguished by its size, often five feet or more in height. The colour is grizzled grey and the fur is rather coarse; the nose is hairy.

The main mating month is December, the gestation period lasting about 40 days. Life in the pouch is very prolonged and the young quit it after about ten months. The Forester Kangaroo was once very widespread in Tasmania but is now confined to the north-east and east; it is a wholly protected species. The species *Macropus giganteus* is widely distributed in continental Australia and *tasmaniensis* is a sub-species.

Rat Kangaroos

(18) *Bettongia cuniculus*

The Bettong is the largest of the rat kangaroos and superficially resembles a small wallaby; the easiest distinguishing feature is the tail, which, in the bettong, is laterally compressed and usually white-tipped. Another animal it resembles is the potoroo and in this comparison, the basic relationship is between hind foot and head; in the bettong, the hind foot is longer than the head but, in the potoroo, the hind foot is shorter.

The face of the Bettong is shorter than that of the potoroo and the animal ranges in colour from sandy to dark brown, with the undersurface lighter. The species is widely distributed and lives on the fringes of forests or in lightly forested areas, as compared with the potoroo which prefers low thick scrub and the fringes of rain forests. Bettongs are nest builders, using bark or grass, and eat mainly roots; favourite sites for nests are hills exposed to the sun, with light timber and grass cover.

The breeding season is long, from at least March to December, and the gestation period is about six weeks; the one young spends about four months in the pouch, although twins are sometimes carried. The species is confined to Tasmania and is sometimes known as the Tasmanian rat kangaroo.

(19) *Potorous tridactylus*

The Potoroo can be distinguished from other macropods by the hind foot being shorter than the head; the snout provides an alternative name, long-nosed rat kangaroo. The usual colour is dark brown, with the under-surface greyish brown. The animal avoids open country and inhabits thick scrub where its diet is mainly roots.

The gestation period is about 35 days, when one young is born; it then lives in the pouch for about 135 days. The pouch contains four nipples and young may be found in the pouch of

captives taken at any time of the year. The potoroo is widely distributed in Tasmania and was once common in the eastern States but is now believed to be almost extinct there.

Wombats

(20) *Phascolomys ursinus*

The Wombat is often called a badger, on account of its robustness and burrowing habits, but it far excels the true or placental badger in strength and in ability to dig deep tunnels with great rapidity. The animal is squat and bear-like in shape, powerfully built and with a very small tail. The usual colour is brown though grey and buff variations occur.

The animal usually lives in a burrow, though caves or piles of rocks may also serve for a den; it feeds on herbage and grasses and prefers open forest country or rocky areas, from sea level to as high as 3,000 feet. It avoids thick rain forest, probably to get freedom of movement. The wombat family is widespread in Tasmania and on the Australian continent, but its reproductive habits are not completely known; the young, usually a single individual, is born in the autumn, but there are two nipples available for suckling.

Protection Policy

The preservation of the State's indigenous animals is a major aim of the Animals and Birds Protection Board and, under State legislation, species may be declared wholly protected or partially protected. Wholly protected marsupial species include the pouched mice, the pigmy and flying possums, the native cats, the Tasmanian tiger and devil, the bandicoots, the Forester kangaroo, the bettong and the potoroo.

The brush possum and the ringtail possum are partially protected species, the animals being hunted for their skins; 'partially protected' means that the Board can nominate the opening and closing days for the hunting period, or alternatively keep the season closed for years at a time. The main consideration is the survival of the species and, due to low ringtail numbers, there has not been a season declared for some time. The two wallabies, Bennett's and the pademelon, are also partially protected, the question of open or closed seasons being a little more complex; not only are they hunted for skins and meat but, if allowed to thrive on the fringe of settled areas, they become a pest, attacking farmers' crops and competing with farm animals for the grass and herbage on pasture lands. The wombat is not protected but the survival of the species is assured; the animal, being a burrower, is something of a nuisance on farm properties but is not hunted for skin or meat in the bush and few would destroy this harmless, attractive creature without good reason.

In addition to the protection measures just described, there are, of course, national parks and game sanctuaries where no hunting or destruction is allowed at any time of the year.

In the 1967 season, the number of skins taken by hunters was: possum, 104,488; wallaby, 26,308; pademelon, 30,122. The police, who issue hunters', sellers' and dealers' licences, obtain a count of skins from royalty payment collections.

(Further reading: (i) *Marsupials of Tasmania*, author Dr E. R. Guiler, booklet of Tasmanian Museum and Art Gallery. (ii) *Marsupials*, article in Encyclopaedia Britannica.)

Tasmania Together (Feature Article)

What is Tasmanian Together?

Tasmania Together (<http://www.tasmaniattogether.tas.gov.au>) is a community-owned 20-year social, environmental and economic plan for the State of Tasmania. The plan presents a community vision for the State and seeks to measure progress towards the vision. It is intended to focus decision-making in the community and more particularly government beyond the election cycle.

How was the process initiated?

The concept was proposed by the Bacon Labor government and received the support of the Liberal Party and the Greens in Parliament. It was inspired by similar concepts in other parts of the world, most notably Oregon in the USA.

How will progress be measured?

The plan includes 212 benchmarks, which will be used to measure progress towards achieving the objectives defined in the plan. The term 'benchmark' refers to the unique combination of a broad goal, a standard (more specific measurable statement that supports the goal), an indicator and its associated target(s). Further, benchmarks are typically accompanied by a rationale that explains the selection of the benchmark.

EXAMPLE OF A BENCHMARK

Goal	Standard	Indicator	Targets	Rationale
Goal 5. Develop an approach to health and wellbeing that focuses on preventing poor health and encouraging healthy lifestyles.	1. Improve Tasmanians' health through promotion of a comprehensive approach to a healthy lifestyle	1.1 Percentage of population who do medium/high intensity exercise 1995: Tas. 31.5%	2005: 35% 2010: 45% 2015: 55% 2020: 75%	There is a high correlation between fitness and health.

Who will be responsible for monitoring?

An independent statutory authority, the 'Progress Board', consisting of 9 members selected from public nominations has been established. The Board will have responsibility for:

- monitoring progress towards achieving benchmarks;
- reporting to Parliament; and,
- promoting Tasmania Together within the community and encouraging the formation of coalitions of interest to work together in support of the plan.

Impact on government

The Bacon Labor government's commitment to Tasmania Together has resulted in changes to governmental structures and processes. Changes are intended to complement existing processes to ensure Tasmania Together objectives are addressed by Government. Changes include:

- the contribution of agencies to a three-year strategic document 'Tasmania Together Performance Plan'.

- budget process and timeframes changed to integrate Tasmania Together with the budget cycle. Cabinet advises the Budget Committee on priority benchmarks and initiatives. The focus of the Committee has been broadened to include monitoring agencies' performance on priority benchmarks. Membership of the Budget Committee has been expanded to include a former Community Leaders Group member to support this expanded role. The Budget Committee will consider agency bids in the context of priority benchmarks and will include agency initiatives and performance indicators relevant to Tasmania Together in the Budget Papers.
- the monthly 'Heads of Agency' meeting now includes Tasmania Together as a standing item. 'Heads of Agency' both reports to and advises Cabinet with respect to Tasmania Together benchmarks, determines which agency should report on particular benchmarks, and encourages a uniform approach to agency reporting.

Examples of other Community Plans

- Oregon USA 'Oregon Shines'. Benchmark Performance Report available from <http://www.econ.state.or.us/opb>
- UK Government 1999 report 'A Better Quality of Life: a strategy for Sustainable Development in the United Kingdom'.
- South Australia: SA Business Vision 2010.

HISTORY/TIMELINE

Date	Event
Dec 1998	Cabinet decision to undertake Tasmania Together.
May 1999	Formation of Community Leaders Group (CLG) . Appointments made by the Premier in consultation with other political parties from 140 names received in a public nomination process. All appointees were volunteers.
Jul 1999	'Search Conference' held . Members of the CLG listened to the views of 60 Tasmanians from a broad cross-section of the community at a three-day conference. This 'Search Conference' was a starting point for Tasmania Together. It resulted in a draft document 'Our Vision, Our Future', for distribution throughout the State as a basis for broad community discussion.
Dec 1999	'Our Vision, Our Future' released and distributed to 14,000 organisations and individuals.
Feb - May 2000	Community consultation consisting of over 60 public meetings at venues around the State. The CLG also consulted 100 community organisations, received 160 detailed written submissions, 4,000 comments sheets from readers of 'Our Vision, Our Future', 6,200 messages from web-site visitors, and 2,500 postcards.
Oct 2000	Final visions and goals released .
Dec 2000 - Jun 2001	Benchmarking process undertaken . The CLG invited nominations from the public in order to continue community involvement through benchmarking.
Jun 2001	Legislation to create Progress Board passed by Parliament.
Aug 2001	Benchmarks finalised by CLG.
Sep 2001	Public release of Tasmania Together.
Oct 2001	Progress Board appointed .
Nov 2001	Progress Board first meeting .
Feb - Jun 2002	Monthly forums held at various locations around the State. Forums serve as an opportunity for the Progress Board to report on its activities and to share ideas about community involvement in Tasmania Together.
Aug 2002	Target date for the tabling in Parliament of the first Tasmania Together Progress Report .

Parliamentary reform (Feature Article)

Feature Article - Parliamentary reform

In 1998 Tasmania's bi-cameral Parliament reduced its overall numbers by 26% and its lower or governing house by 28%. Coming almost exactly 100 years after the introduction State-wide of the Hare-Clark electoral system of proportional representation, it was arguably the most significant change since that event; comparatively it was a massive change.

It was achieved amid the applause of many, mainly business and media interests, but to the anguish of others who saw the foundations of democratic representation severely strained.

Two critics of the move were notable for recognising that Tasmania's Parliament did need overhauling but their remedies were different from the reduction in numbers strategy. In 1997 Dr Ralph Chapman, formerly a member of the Morling Board of Inquiry into the Size and Composition of the Tasmanian Parliament, wrote an article that was prominently reported in the Mercury newspaper and is featured below. At the end of 1998 Harry Evans, Clerk of the Senate, gave a paper to the Australasian Study of Parliament Group's 20th Annual Conference proposing a similar parliamentary structure; an edited version is produced below.

Extract from **'Goodbye Westminster? A Small State Perspective on Changing Political Institutions'** by Dr Ralph Chapman, Honorary Associate, Department of Government, University of Tasmania

There are two alternative broad options for replacing Westminster. One is to move in the direction of a presidential executive system, the other is a different type of liberal democratic parliamentary system. Around the world there are numerous examples of parliamentary democracies in which legislature and executive are separate and which do not regard themselves as executive presidential systems because of the way in which accountability is maintained. The two offices of head of state and head of government can remain separate but as the representatives of the people parliament must retain the necessary authority to give legitimacy to those who govern.

Liberal democratic government demands an absolute commitment to governing in the public interest, on behalf of all people in the state. Accountability to the people for government actions is therefore of critical importance. Parliament must be so structured and its procedures so organised as to provide for true representation and accountability. A unicameral parliament is in greater danger of succumbing to executive dominance unless provisions to curb such occurrences are constitutionally entrenched. Parliament must be able to act as a forum for public discussion rather than merely a theatre in which to dramatise the two party adversarial charade. Legislation and policies must be exposed to public debate and criticism through parliament.

Calling those clothed with state authority to account is a prime function of parliamentary democracies. In small states to ensure this happens solely through parliament is extremely difficult. Other means must be employed, such as an extra-parliamentary form of administrative law, including an ombudsman and freedom of information legislation.

A PROPOSAL

One possible institutional design for a single house in a state with a small population like Tasmania, is outlined below. It is intended to incorporate all the above facets. One issue on which I remain ambivalent is whether the parliament should appoint and dismiss the government. While I accept that parliament is not sovereign, in this proposal I am not certain that it is enough to rely on direct election of the premier and the representativeness of the parliament. I have therefore retained the need for there to be a constructive vote of confidence in the premier much as occurs in the German Bundestag. The alternative would be some form of impeachment proceedings but this seems to much like letting the horse bolt when we could have shut the stable doors first.

- Tasmania would have a unicameral Legislative Assembly of 40 members elected from the four electorates (rather than the existing five based on federal electoral boundaries) using the Hare-Clark electoral system of proportional representation. This method of voting has strong and unequivocal public support in Tasmania, enabling and encouraging the expression of community values in its political representation. Having ten members in each electorate will ensure a low quota, guaranteeing the return of independents and minor parties, therefore broadening the representativeness of the parliament and decreasing opportunity for major parties to be sure of majorities.
- The link between the Legislature and the Executive will be broken by electing the Premier by a popular statewide vote. The election will be for a four year term with no opportunity to go to the people at will, as is now the case (although subject to some limits). The Constitution must provide for unforeseen eventualities such as death in office, corruption, maladministration, etc. and also for a situation where the Premier loses the confidence of the parliament.
- The Premier, once elected, must appoint no more than five ministers who will form the Executive. They must not be members of parliament but must be on the Tasmanian electoral roll. Their appointment will be subject to the formal approval of parliament. This procedure will ensure that the separation of legislature and executive will be maintained and the executive remains accountable, collectively and individually, to parliament.
- Because the ministers will not be members of parliament, procedures will be required to ensure they can introduce their legislation personally and be called before either the whole of parliament or its committees. A system of rostering ministers to appear before committees should be implemented. A committee system with power to subpoena is an essential aspect of accountability with separation of powers. A Legislative Assembly of 40 members will contain enough members to form a highly effective committee system. It is unlikely that the Executive would be able to control its operations through a majority on the floor of the House so it would be free to function as a strong constraint on government. At the same time it would be able to involve interested groups and community organisations in its deliberations engendering a participative political climate appropriate for a small population. A committee system would have to be protected in some way against the money power of the executive. It could be entrenched in the Constitution to ensure its protection from executive intervention or parliament could ensure control of funds for its functions.
- The organisation of the public service would be at the discretion of the Premier as would allocation of portfolios amongst appointees. There are a number of possible options from one for each executive (no longer cabinet) member to having each member responsible for several (as is now the case). Whatever is decided the CEOs of departments, i.e. appointed officials, would be required to appear before Legislative Assembly committees, if requested. The distinction, currently practised, between policy and operations (administration) would not prevail and CEOs would be able to be

questioned on any aspect of their activity as part of government accountability. A body similar to a Public Service Commission would be needed to prevent nepotism etc.

- Parliamentary procedures would have to be changed and standing orders re-written. While the Premier or a proxy, would be required to attend Assembly sittings. Ministers whose legislation is before the Assembly will also be required to attend. They would not have a vote in the Assembly. There would be no Question Time as at present and much of the effort that now goes into that would become part of the committee system. This would give much more time for debate on the policies for which legislation or regulation is required. It would also open up the opportunities for individuals and communities to become part of that process by their attendance at Assembly and committee sittings.
- A number of extra-parliamentary arrangements for accountability, such as the Ombudsman, the Auditor General, the various Commissions for Human Rights, against discrimination and corruption should be retained. Their establishment and functions should be constitutionally entrenched as directly responsible to the Legislative Assembly not the executive.

The above outline has not addressed many questions of detail but it is argued that there is sufficient to enable others to assess its potential. Essentially, the proposals will guarantee the seven critical purposes of a democratic parliamentary system and the five functions of an effective parliament. It allows the community opportunities for involvement in political issues other than merely by protest rallies and confrontation. It removes the highly damaging adversarial two party and two house conflict which has the effect of making parliament irrelevant to the people. This proposal balances the exercise by the collectivity of final control over the agenda of government concerns and a commitment to individual liberty which Hindess posits as the essence of democracy. (B. Hindess "Democracy and disenchantment" Journal of Australian Political Science 1997 32(1) p. 83) It inhibits political arrangements tending to exclude the direct involvement of the people in their government, especially where a small population makes this probable.

Edited version of '**Constitutional Safeguards, Bicameralism, Small Jurisdictions and Tasmania**', by Harry Evans, Clerk of the Senate

Two of the primary difficulties of framing a satisfactory system of government are, first, to provide constitutional safeguards which are effective, and secondly, to provide such safeguards in small jurisdictions.

The aim of constitutional government is the avoidance of simple majoritarianism. In practice this means the avoidance of the situation where a political party which gains a simple majority, which is usually less than 50% of the total votes, rules the country. This form of government is exemplified by the so-called 'Westminster system' whereby such a party controls the legislature and forms the government. In the Australian context this means, or would mean but for constitutional safeguards, that the leaders of the faction which controls the party which gained the majority, rules the country.

Simple majoritarianism tends to destabilise democracies, because it produces overbearing majorities and alienated minorities. Simple majority government is more easily captured by a self-perpetuating faction to bring about this situation.

The cure for the evils of simple majoritarianism are institutional arrangements, particularly in the construction of the legislature, to encourage the formation of distributed majorities. If

institutions require, for the making of major political decisions, the support of majorities distributed across different groups in society and different regions, factious government is made more acceptable and stable.

Federalism is a particular institutional arrangement which seeks to ensure the formation of distributed majorities by requiring special majorities for the passage of laws. But in the individual states of the federation this safeguard does not operate. How then are safeguards to operate at the state level.

Small jurisdictions pose particular problems. Structures to ensure constitutional government are inevitably complex and difficult to maintain; they are also relatively more expensive in small jurisdictions, yet have to operate often in a climate of concern about cost of government.

Tasmania has provided a particular manifestation of this problem. The moves to create a smaller parliament are an indication of the natural tendency to simplicity and economy of government. With a small legislature however, it is more difficult to secure adequate representation of all shades of opinion, and this makes an undistributed factional majority more likely. It also undermines a fundamental virtue of legislation by representative assembly, that of adequate deliberation as a small assembly tends to become more like a caucus and deliberation is contracted. In short constitutional government can be weakened by mere changes in the size of the legislature. There is an optimum size for a legislature which is not related to the size of the electorate and Tasmania is now below this optimum size.

There is a further problem; the maintenance of cabinet government where a Ministry is appointed from the majority and a shadow ministry from the minority. This is a system which evolved in a house of over 600 members. With a small house there are too few backbenchers left to undertake the parliamentary roles of monitoring executive activities and scrutinising legislation. The proper performance of such roles depends on there being significant numbers of backbenchers who have no hope of ever reaching the front bench and therefore have no incentive to be either servile to their party leaders or simply troublesome in the hope of gaining promotion.

There is also the problem of restricting the choice of ministers to a small pool of candidates. This leads to the conclusion that cabinet government cannot work properly in small jurisdictions with small assemblies. It simply becomes a form of absolutism: the cabinet controls the legislative as well the executive power.

Difficult problems require radical solutions. The houses of parliament of the state could continue with their current composition and powers. At the same time as the lower house is elected, a governor would be directly and separately elected by the electorate. The governor would be head of state as well as head of government and would appoint a small cabinet of ministers from outside the parliament, thus enlarging the ministerial talent pool. The parliament would perform the legislative functions of passing laws and scrutinising the operation of government. As governor and parliament would each be elected for a fixed term, there would be no power of dissolution and no early elections.

It is suggested that the houses have the ability to scrutinise, but not to veto, executive appointments while an executive veto of legislation could be overridden by a special majority of the houses.

Tasmanian election 1998 : a background report (Feature Article)

Feature Article - Tasmanian election 1998 : a background report

When in April 1997, the Premier, Mr Tony Rundle, delivered a 'directions statement' that included a radical restructuring of Parliament, he set in train events, which 16 months later, resulted in the defeat of his Liberal government and the election of Mr Jim Bacon as Premier of the first majority Labor government since the Lowe government was elected in 1977. In so doing, he achieved the most significant change to the structure of Parliament since the introduction of the Hare-Clark voting system almost 100 years before.

Among a series of proposed initiatives, Mr Rundle foreshadowed a referendum on parliamentary reform. He said that with 54 State MPs and 29 councils, Tasmania was over governed. While academics were critical of what they saw as an erosion of democratic values, business leaders, on the other hand, were critical of uncertainty caused by minority government and too many politicians. They saw economic development as dependent on majority government.

In July the peak industry body, the Tasmanian Chamber of Commerce and Industry (TCCI) released its plan for parliamentary reform: a single chamber house consisting of 40 members with 25 elected from five electorates and 15 elected from single-member electorates. The proposal meant retaining the Hare-Clark system of proportional representation but with a higher quota, which, combined with the 15 single-member electorates, would deliver majority government. The proposal would abolish the Legislative Council, which the TCCI saw as an unnecessary impediment to progress. To others, however, it represented an important and desirable check on unfettered government.

Shortly after, the Hon. Peter Nixon released a radical proposal (see TYB 98 pp51-53) for the creation of a single-chamber Parliament of 27 members, elected from nine, three-member electorates. Mr Nixon also focused on the Legislative Council and minority government as the cause of Tasmania's economic woes. He said governments needed to be able to get on with governing.

THE RUNDLE PLAN

The foreshadowed Rundle proposal for reform of Parliament was tabled in Parliament on 16 September 1997. It proposed a single-house Parliament, of 28 members elected from four, seven-member electorates plus 12 elected from single-member electorates with a special mechanism for ensuring majority votes in the Parliament. As Mr Rundle knew, the challenge was to get such a proposal through the Legislative Council; Mr Rundle's proposal was to use a referendum that was designed to capitalise on clear public support for a cut in the number of MPs to lead to support for his proposed structure. The Council, however, expressed support for the Labor Party's plan for a bicameral Parliament consisting of a 25-member Assembly elected from five electorates and a 15-member Council elected from single-member electorates. It substantially amended the Bill, killing the proposed referendum, in a manner unacceptable to the government. A compromise proposal for a bicameral 28-seat Assembly and a 12-seat Council also failed to win the support of the Council and the issue appeared dead.

Instead, it rested till May 1998 when it re-emerged in the form of a Labor Party Bill for a 25-seat Assembly and a 15-seat Council. The turning point came when a Liberal backbencher, Mr Bob Cheek, crossed the floor to vote for the ALP proposal. Then to the surprise of even

his own Cabinet, Mr Rundle recalled Parliament for a special two- day sitting of Parliament to adopt the ALP's reduction proposal. At the same time, he announced his intention to sell the Hydro-Electric Corporation and the date for an early election. Despite vociferous protests from Tasmanian Green MPs, who could see their seats under threat, the legislation was quickly passed by both Houses, allowing for an election for 25 members. Yet although the proposal was largely welcomed, there were those who argued that it was not 'parliamentary reform'; merely a first step towards a substantial restructuring (see special article 'Parliamentary reform').

HISTORICAL BACKGROUND

The public rationale for the reduction in numbers of politicians was over-government; this was given a statistical framework by the Morling Inquiry.

RATIO OF POLITICIANS TO POPULATION

Jurisdiction	Ratio of politicians to population	Politicians per 100,000 population
Federal	1: 114,741	1.26
NSW	1: 42,720	2.34
Vic.	1: 33,850	2.95
Qld	1: 34,454	2.83
SA	1: 18,542	4.71
WA	1: 21,254	5.40
Tas.	1: 8,743	11.42

Source: Report of the Board of Inquiry into the Size and Constitution of the Tasmanian Parliament, 1994

NUMBERS OF POLITICIANS, RATIO TO POPULATION, TASMANIA

Year	Assembly	Council	Total	Population(a)	Ratio
1856	30	15	45	81,492	1: 1,811
1871	30	16	46	99,328	1: 2,159
1885	30	18	48	115,705	1: 2,411
1898	30	19	49	146,667	1: 2,993
1907	30	18	48	190,745	1: 3,974
1947	30	19	49	267,936	1: 5,468
1958	35	19	54	346,545	1: 6,418
1998	25	15	40	(p) 471,885	1: 11,797

(a) For population figures, actual years were 1857, 1870, 1881, 1891, 1906.

Source: ABS data available on request, Demography and House of Assembly, Legislative Council

The Tasmanian Parliament was constituted as a bicameral Parliament by the Constitution Act 1854, with its first sitting on 2 December 1856. There were 30 members of the Assembly and 15 Councillors. For the next 100 years, the Assembly numbers remained at 30 while the Council numbers rose to 19.

During the 1950s a problem of a deadlocked House developed. As the inaugural 1967 Tasmanian Year Book reported, 'one of the virtues claimed for the Hare-Clark [electoral] system is the adequate representation given to minorities. In a small House of 30 members, this virtue tended to be too evident and led to situations where the government of the day did not have the necessary majority to carry all its legislation with confidence'.

The first solution, to give the minority party the right to nominate the House of Assembly

Speaker, was not seen as an adequate provision. The solution proposed was to increase the number of MHAs to an uneven 35, which was done.

It obviously went unnoticed, but the first election under the new provisions produced a 'hung' parliament (17 Labor, 16 Liberal and 2 Independents) prior to a period of 7 elections that produced 'majority' governments.

This came to an end with the watershed 1989 election. While the Liberal Party won most seats (17), 5 Independents grouped together and produced an 'accord' with the minority Labor Party through which the ALP, with Mr Field as leader, became Government. It didn't work; the 'accord' collapsed and a Liberal majority government was elected in 1992 after an early election called when the Greens threatened a no-confidence motion. During the campaign the ALP vowed not to return to an 'accord' or coalition arrangement, leaving the Liberals in government but as a 'minority' government. But by 1998 their enthusiasm for such an arrangement had waned considerably; under the guise of 'parliamentary reform' the parliament itself was restructured.

REPRESENTATION BY PARTIES, TASMANIAN HOUSE OF ASSEMBLY(a)

Election year	Labor	Liberal	Other
1959	17	16	2
1964	19	16	0
1969	19	16	0
1972	21	14	0
1976	18	17	0
1979	20	15	0
1882	14	19	2
1986	14	19	2
1989	13	17	5
1992	11	19	5
1996	14	16	4
1998(a)	14	11	1

(a) House of Assembly reduced to 25 seats.

Source: House of Assembly

Tasmanians in federal cabinet: 1900-2000 (Feature Article)

Feature Article - Tasmanians in federal cabinet: 1900-2000

During the first century of Federation, more than 30 Tasmanians have been Ministers in Federal Governments.

MEMBERS OF THE HOUSE OF REPRESENTATIVES

Atkinson, Llewellyn (NAT)
Barnard, H. C. (ALP)
Barnard, Lance (ALP)
Braddon, E. N. C. (FT)
Culley, C. E. (ALP)
Fysh, P. O. (FT)

Groom, Raymond
Kerr Duncan (ALP)
Guy, James Alan (ALP/UAP/LIB)
Hodgman, W. Michael (LIB)
Jensen, J. A. (ALP)
Lyons, Enid (LIB)
Lyons, Joe (ALP/UAP)
Newman, K. E. (LIB)
O'Malley, K. (ALP)
Smith, W. H. C. (ALP)
Spence, W. G. (ALP/NAT)
Townley, Athol Gordon (LIB)
Smith, W. (LIB)

SENATORS

Clemons, J. S. (LIB)
Earle, John (NAT)
Frost, C. W. (ALP)
Grimes, DR. D. (ALP)
Henty, N. H. D. (LIB)
Keating, J. H. (LIB)
McKenna, N. E. (ALP)
Marriott, J. E. (LIB)
Newman, J. (LIB)
Ogden, J. E. (ALP/NAT)
Tate, M. C. (ALP)
Turnbull, Reg J. D. (LIB)
Wridt, K. S. (ALP)
Wright, Reg C. (LIB)

Tasmanians in other national leadership positions (Feature Article)

Feature Article - Tasmanians in other national leadership positions

Joe Lyons: ALP Premier of Tasmania, 1916-19 and 1923-28, following which he switched to federal politics at the 1928 election and became Postmaster-general and then acting Treasurer. In May 1931, he switched to the newly formed United Australia Party as Leader and became Prime Minister at the December 1931 election. He died in office on 7 April 1939.

Lance Barnard was Deputy Leader of the Labor Party from 1967 until he became Deputy Prime Minister in the first ALP Government since 1949 on 5 December 1972. He held this position until 1974. He retired from parliament in 1975 and was appointed Australian Ambassador to Norway, Sweden and Finland.

Dame Enid Lyons, G. B. E. First woman member of the House of Representatives and first woman Minister of the Federal Government

Sir G. J. Bell. Speaker of the House of Representatives, 23 October 1934 to 19 November

J. B. Hayes. President of the Senate, July 1938 to June 1941, and Senator for Tasmania, 1923 to 1947. Liberal Premier of Tasmania, 1922-23

J. O'Byrne. Elected Senator in 1946. Opposition Whip 1962 to 1972 and Government Whip 1972 to 1974. Elected President of the Senate 9 July 1974 to 11 November 1975.

The Nixon Report: Tasmania into the 21st Century (Feature Article)

Feature Article - The Nixon Report: Tasmania into the 21st Century

During the campaign for the 1996 Federal election, the Coalition unveiled a number of specific policies relating to Tasmania. One of these was the promise to establish a committee of inquiry, funded jointly by the Commonwealth and Tasmanian State governments, which would conduct a detailed investigation of the Tasmanian economy and advise on policies to improve its performance. This initiative was motivated by the chronically below-average performance of the Tasmanian economy, and the perception that this had become more pronounced during the 1990s.

In October 1996, the Hon. Peter Nixon, AO, a member of Federal Parliament from 1961 to 1983 and Minister under the Fraser Government, was appointed to chair this inquiry, known officially as the Commonwealth-State Inquiry into the Tasmanian Economy.

The principal task undertaken by the Inquiry was the comprehensive analysis of the Tasmanian economy and the legislative and executive environment that governs its operation. The analysis was performed on the basis of information collected from 5 main sources:

- Written submissions received from interested parties;
- Face-to-face meetings with representatives of various organisations;
- Public forums held in each region of Tasmania;
- Past reports undertaken into aspects of the Tasmanian economy; and
- Official statistical information, both published and unpublished.

The Inquiry's findings were made public on July 30 1997, as *The Nixon Report: Tasmania Into the 21st Century*.

In summary, the Nixon Report determined that Tasmania's poor economic performance was the result of critical problems in 5 main areas. These were:

Governance

The structure of government in Tasmania compromises the strong and effective leadership of the State and impedes the development of policies to benefit the long-term development of the State. Significant problems were identified in both the structure and operations of Parliament, Cabinet, the bureaucracy and local government.

Government finances

The existence of a very large government debt, primarily accrued during the 1980s, places severe constraints on the spending and taxation options of the State Government. Because of this, the debt exacerbates Tasmania's weak economic performance and prevents the State Government taking effective action to assist economic development.

Education and training

Tasmanians have lower skill levels than the national average, and the State has a substantially lower proportion of students continuing education through to Year 12. School leavers are not perceived to be job-ready, and existing training regimes do not meet the needs of Tasmanian businesses.

Industry development business environment

Industry development policies are poorly focused and lack a strategic direction. The business environment in Tasmania is unattractive to investors: characterised by severe taxation and other on-costs, unavailability of finance, inefficient ports and archaic transport regulations.

Planning processes

The regulations regarding planning are complex and are not well understood by either developers or those administering the system. There is an excess of independent bodies, that are not accountable for their actions, involved with the planning process.

The Nixon Report detailed 122 separate recommendations designed both to overcome the identified problems and to build upon Tasmania's advantages and opportunities including:

GOVERNANCE

- Both Houses of Parliament to be dissolved, and a new single chamber to be instituted, comprising 27 members elected from 9 three-member electorates;
- The Hare-Clark voting procedures to be retained;
- Parliament's operations to be overseen by a Public Bodies and Accounts Committee (PBAC), modelled along the lines of the Federal PBAC;
- Cabinet to be reduced from 10 to 7 (including the Premier), each responsible for one of the 7 restructured government departments (reduced from the current 13);
- Department heads to be directly responsible to the Minister through performance agreements which contain both positive and negative incentives;
- The roles of local and State government to be clearly defined, with effective delegation of identified responsibilities;
- There should be a maximum of 8 local government areas on mainland Tasmania (compared to the present 29), with the Bass Strait islands administered separately and receiving greater support from the State Government.

GOVERNMENT FINANCES

- Tasmania should aim to have zero net public sector debt by the year 2000. In particular, the liabilities relating to the core operations of government (or general government) should be totally eliminated;
- This can only be achieved by the sale of public assets. Primarily, the Hydro-Electric Corporation (HEC) should be disaggregated into separate business units and totally privatised;
- Following this, budget deficits are to be outlawed, and procedures implemented which prevent the State Government accruing debt over successive years;
- The savings made from debt elimination, in the form of reduced interest payments, are to be used to reduce both payroll and land tax, and supplement infrastructure outlays and investment in business development;
- Further initiatives to assist economic growth to be funded by revenues from the sale of a number of other government businesses, including the port authorities, TT-line and the Motor Accident Insurance Board (MAIB).

EDUCATION AND TRAINING

- Support was given to the education-related initiatives detailed in the Government's Directions Statement, which aim to ensure that all students achieve core literacy and numeracy competencies;
- The Government to remove the structural barriers which discourage students from regional areas from continuing schooling beyond Year 10;
- Various reforms to the operation and organisation of TAFE, including a greater focus on the current and emerging skill needs of local industry, and a unified State-wide structure with clear accountability and responsibility of TAFE directors to the Minister.

INDUSTRY DEVELOPMENT POLICY

- State Government should form the Department of State Development and Infrastructure, which should be allocated in each budget a fund for industry development lending. Lending from this fund would be the sole responsibility of the Tasmania-Development and Resources (TDR) Board, with the Government having no capability to direct the Board on any individual funding proposal;
- State Government to provide seed funding for the establishment of one or more pooled development funds in Tasmania;
- Adoption of reforms by both the State and Commonwealth governments to improve the competitiveness and efficiency of waterfront and transport operations.

PLANNING

- Overall streamlining of the planning regulation system, incorporating the following: development of an over-arching strategic direction for the planning process; rationalisation and standardisation of the proliferation of planning schemes; restriction of the scope for individuals to appeal against particular planning permits; and compulsory accreditation of those administering the planning system.

ENERGY

- Prior to privatisation, the HEC should be split into 5 competing generation enterprises (based on existing catchment areas), 2 competing franchised distribution operations (along north/south lines) and 1 transmission system enterprise;
- The privatised retailers/distributors should continue to be regulated, and this overseen by the Government Prices Oversight Commission (GPOC);
- State Government should facilitate the development of Basslink, to integrate Tasmania's energy market with the mainland electricity grid and assist the move to a fully competitive energy market;
- Outstanding Gordon-Below-Franklin compensation funds owed to Tasmania by the Commonwealth should be used to fund the exploration of natural gas from the Yolla gas field, together with the establishment of a natural gas market and a capacity to generate electricity from natural gas.

OTHER SECTOR SPECIFIC

- A range of recommendations were also made for the reform and enhancement of the following sectors: forestry, agriculture, fisheries and also marine farming, tourism and other service industries, and leisure and entertainment.

Local government in the 1990s (Feature Article)

Feature Article - Local government in the 1990s

Contributed by Dr Colin Balmer, Deputy Director, Municipal Association of Tasmania

During the 1990s Tasmanian local government has undergone more change than at any time since its establishment, and this trend appears set to continue until the turn of the century.

Over the past fifty years since World War II there have been several attempts at reforming the system, but these came to little except for the merger of Queenstown and Gormanston to create the Municipality of Lyell, and the absorption of St Leonards and Lilydale into the City of Launceston during the 1980s. The recent reforms have been focused on structural change, legislative change affecting the powers local government councils may exercise, and procedural changes to the manner in which they operate.

STRUCTURAL CHANGE

In November 1989 the Minister for Local Government announced that he would initiate a reference to the Local Government Advisory Board aimed at reducing the number of councils. Instead of opposing this move, Local Government responded by suggesting that the local government system be 'modernised', with a rationalisation of State-local functions and finances, legislative reform, and structural change all considered as an integrated

package. This reform package is now partly in place, while reviews to finalise it are underway.

Structural change was completed first, with the Local Government Advisory Board reporting to the Minister for Local Government in September 1992, and the reduction in the number of councils from 46 to 29, that it had recommended, coming into effect in April 1993. These territorial changes affected mainly the smaller councils as most were abolished through mergers with neighbours. Most of the larger cities were left largely unchanged.

An important part of the structural changes has been the decision by most councils to abandon the ward, or electoral district, base for council elections. Only three councils now retain this base, with all others having their councillors elected by the whole municipality.

LEGISLATIVE CHANGES

As part of the modernisation program, a new Local Government Act came into effect from the beginning of 1994. A package of several other Acts, dealing with the land use planning system and environment protection, has been enacted. A new Building Act is expected to be considered by Parliament late in 1995.

The Local Government Act 1993 provides the constitution under which councils operate. It removed the distinctions between Hobart and Launceston (which formerly operated under their own legislation) and all other councils by making all councils subject to the same Act. The Act also provides councils with a 'general competence power', enabling them to take whatever measures are needed to give effect to their decisions, rather than being restricted to exercising only those few powers which are actually listed, as was the case with the former Local Government Act.

The Local Government Act, while generally continuing the rating powers of the previous Act, also provides a power to set differential rates. This will increase flexibility and enable councils to apply their revenue raising powers in more sensitive and effective ways than was previously the case. Differential rating has been available in the other States for some time.

Councils are also able to delegate matters to local committees if they wish. This is particularly relevant for councils which are large in area (such as Northern Midlands) or otherwise have distinct local areas (as in the case of Kingborough which now incorporates Bruny Island). Councils may also join with other councils to create joint authorities, when they decide, for example, that they will be able to undertake a particular function more efficiently by operating over a wider area than a single municipal area. The first joint authority has been established by four councils in the north of the State to provide waste disposal services.

The planning and environment legislation consists of several separate Acts. A similar philosophy underlies all these Acts: the desired outcomes are to be achieved by following the procedures which are most appropriate, rather than ones prescribed in legislation.

The State Policies and Projects Act 1993, among other things, provides for the development of State Sustainable Development Policies, which will ultimately provide a set of guidelines for actions by all agencies (public and private) to ensure that developments will be ecologically sustainable in the long term. It also provides for the preparation of a regular environment audit report.

The Land Use Planning and Approvals Act 1993 provides a framework within which councils and marine boards may undertake their planning responsibilities for all municipal areas and coastal waters. It also establishes a Land Use Planning Review Panel to approve planning

and development applications.

The Environmental Management and Pollution Control Act 1994 provides for the control of activities that could lead to environmental harm. It classifies functional activities into three categories, with local government being responsible for assessing those falling into Level 1. To assist in this, an assessment manual has been prepared to provide guidelines. Codes of practice have also been developed to provide additional guidance.

The Resource Management and Planning Appeal Tribunal Act 1994 establishes a tribunal to resolve conflicts, preferably by mediation, between parties in relation to planning and environment management matters.

These planning and environmental management Acts are of central importance to local government, which regards control over the development and management of the local area as the core of its functional responsibilities.

PROCEDURAL CHANGES

One of the more far reaching changes accompanying the establishment of the new local government arrangements was the decision to conduct elections by post. All residents who are listed on the House of Assembly electoral role automatically receive ballot papers (and a reply paid envelope) for the municipal area in which they live. Thus they are enabled to vote in the council elections without going to a polling booth, if they wish.

This system is expected to be extended to include property owners who are resident in another municipal area elsewhere in Tasmania.

All elected members of local government are now elected for four-year terms, with half the members of each council retiring each two years. With one exception (Launceston), the mayors and deputy mayors of the cities are elected at large by the community. Along with Launceston, the principal member of all other units, now termed 'councils', rather than 'municipalities', is chosen from among councillors at a council meeting.

The principal member is now termed 'mayor' for all units except the capital city of Hobart, replacing the term 'warden' which had been used for municipality leaders. Hobart's chief elected member continues to be termed lord mayor.

The Local Government Act allocates to elected councillors the roles of setting policy and determining the directions of the council, and requires the council to appoint a general manager who is charged with providing professional advice on all matters considered by the councillors and with implementing their decisions.

The council is required to develop a strategic plan covering the forthcoming five years, and to consult with the local community both in determining the contents of the plan, and in relation to the annual report outlining the year's events. Through this means, and others of a similar nature, the Act effectively makes councils responsible to the communities they serve, rather than to the Minister for Local Government and the State Government.

LOCAL GOVERNMENT TODAY

As a consequence of the reforms that have been and are occurring, local government now employs approximately 4,300 people, or 2.2% of the public sector workforce in Tasmania. Its activities contribute 2.7% of the State Gross Product.

Collectively, councils raise a total of \$172 million annually from all revenue sources. Of

these, the property rate is the most important, with the average revenue raised by councils from this source being approximately \$5 million in 1994-95. This amount is a significant increase on the average amount raised prior to the amalgamations that occurred in 1993.

This increased financial capacity, coupled as it has been with an equally significant increase in the numbers of professionally qualified personnel, either employed as staff or retained as regular consultants, has been accompanied by a marked increase in the effectiveness and efficiency of service provision.

Of the reforms foreshadowed when the modernisation program commenced in 1990, those that remain incomplete are the rationalisation of the roles, functions and inter-governmental financial relationships of the State and local spheres of government. A review with this rationalisation as its goal is underway, under the chairmanship of Mr Robert Hand. The review committee is expected to complete the first phase of its program early in 1996 with a report containing recommendations relating to a number of infrastructure services and their financial implications.

CONCLUSION

Tasmanian local government enjoys a positive working partnership with the State Government. This is evidenced by the State's willingness to enter into three formal protocols with local government, signed in 1992 and 1993, guaranteeing the completion of the modernisation program and the allocation of resources for this purpose.

For its part, local government has welcomed the increased responsibility passed to it by the Local Government Act, and has modified its processes to now operate in a more transparent manner in close consultation with the communities that each council serves. It recognises the developments occurring in the wider society-both within Tasmania and the Commonwealth as a whole-in relation both to effective sustainable environmental management and increased operational efficiency. To these ends it is playing a more positive role in environmental management than formerly and is readying itself for the changes that will accompany the much discussed competition policy agreed to by the Council of Australian Governments.

Childhood Determinants of Adult Health Study (Feature Article)

Feature Article - Childhood Determinants of Adult Health Study

Contributed by Dr Alison Venn, Cohort Epidemiologist, Menzies Centre for Population Health Research.

The Menzies Centre has been awarded more than \$2m by the National Health and Medical Research Council (NHMRC) to conduct a major new research program investigating the significance of childhood lifestyle to adult risk of heart disease and diabetes. This grant of \$2.3m is Australia's largest medical research funding grant for 2001, and a record for Tasmania. The funding will enable researchers to follow-up almost 8,500 people from around Australia who, as children, participated in a fitness survey in 1985.

ORIGINAL STUDY, 1985

In the original 1985 study, a range of measures was taken from these 8,500 children,

including size, diet, fitness, physical activity and blood tests. The study involved students from 109 schools throughout Australia, including two in Tasmania: Norwood Primary School in Launceston and Cosgrove High School in Hobart. At the time, the students were between 7 and 15 years of age.

PILOT STUDY, 2001

In 2001, the Menzies Centre ran a pilot study to determine the feasibility of conducting follow-up research on all 8,484 students who participated in the original study in 1985. It aimed to recruit 400 of the original participants, from the two Tasmanian schools and from three of the Victorian schools.

The first step for the pilot study was to find the original study participants, some of whom had moved away or changed their name. Contacting all of the original study participants as part of the full follow-up study was acknowledged as a major and difficult task. The pilot study, which was funded by the National Heart Foundation, proved a success and allowed the Centre to determine the most effective strategies for recruiting participants as well as the rate of recruitment likely to be achieved. The success of this pilot study led directly to the awarding of the NHMRC grant.

FOLLOW-UP STUDY

The Childhood Determinants of Adult Health (CDAH) Study aims to follow this original survey cohort to evaluate their health and fitness now, and in another 10 years time. By following up the original participants, Menzies Centre researchers say they should be able to determine how much lifestyle and other risk factors in childhood affect a person's chances of developing heart disease and diabetes in later life. While much of what is known today about heart disease and diabetes comes from research conducted in adults, there is evidence to suggest that the early stages of these diseases start to occur in childhood. The follow-up study will also help researchers understand how lifestyle and physical measures in childhood affect respiratory, mental and women's reproductive health.

The Menzies Centre is establishing a collaboration with groups in the US and Finland that have followed up similar cohorts of children with similar measures. Pooling the data from the Australian cohort with cohorts in these countries will increase the ability of the study to detect associations between childhood factors and disease occurring in young adults.

It is hoped that interest created by media coverage of the Menzies Centre's activities will help to attract participants. A promotional campaign will begin late in 2002 as part of measures to recruit the original study participants. Participants will be asked to undertake a free health check, with a follow-up in 10 years. The health check will include measurements of blood pressure, height, weight, waist, hips, and cholesterol and sugar levels through blood samples. There will also be a simple fitness test and a measure of lung function.

FOR INFORMATION ABOUT THE STUDY

Anyone who believes they took part in the survey in 1985, or knows any one who did, is asked to contact the Menzies Centre. People with questions about the research can telephone the Centre's toll free number on 1800 638 124 during office hours. More information about the study is also available through the Centre's web site, <http://www.menzies.utas.edu.au>, or by emailing the study's coordinator, Beverley Curry, at email address Beverley.Curry@utas.edu.au.

Diabetes mellitus (Feature Article)

Feature Article - Diabetes mellitus

Contributed by Kris Hazelwood, Manager Diabetes Unit, Menzies Centre for Population Health Research.

Diabetes is a disorder of metabolism - the way our bodies use digested food for growth and energy.

Most of the food we eat is broken down into glucose, the form of sugar in the blood, which is the main source of fuel for the body. After digestion, glucose passes into the bloodstream, where cells for growth and energy use it. For glucose to get into cells, insulin must be present. Insulin is a hormone produced by the pancreas, a large gland behind the stomach.

In people with diabetes the pancreas either produces little or no insulin, or the cells do not respond appropriately to the insulin that is produced. Glucose builds up in the blood, overflows into the urine, and passes out of the body. Thus, the body loses its main source of fuel even though the blood contains large amounts of glucose.

WHAT ARE THE TYPES OF DIABETES?

The three main types of diabetes are:

- Type 1 diabetes (previously known as insulin dependent diabetes or juvenile onset diabetes)
- Type 2 diabetes (previously known as non-insulin dependent diabetes or adult onset diabetes)
- Gestational diabetes.

Type 1 diabetes

Type 1 diabetes is an autoimmune disease. An autoimmune disease results when the body's system for fighting infection (the immune system) turns against a part of the body. In diabetes, the immune system attacks the insulin-producing beta cells in the pancreas and destroys them. The pancreas then produces little or no insulin. Someone with type 1 diabetes needs to take insulin daily to live.

Symptoms of type 1 diabetes usually develop over a short period, although beta cell destruction can begin years earlier. Symptoms include increased thirst and urination, constant hunger, weight loss, blurred vision, and extreme fatigue. If not diagnosed and treated with insulin, a person can lapse into a life-threatening diabetic coma, also known as diabetic ketoacidosis.

Type 2 diabetes

The most common form of diabetes is type 2 diabetes. This form of diabetes is linked to a number of genes. About 80% of people with type 2 diabetes are overweight. Type 2 diabetes is often part of a metabolic syndrome (Syndrome X) that includes obesity, elevated blood pressure, and high levels of blood lipids. Unfortunately, as more children become

overweight, type 2 diabetes is becoming more common in young people.

When type 2 diabetes is diagnosed, the pancreas is usually producing enough insulin, but, for unknown reasons, the body cannot use the insulin effectively, a condition called insulin resistance. After several years, insulin production decreases. The result is the same as for type 1 diabetes - glucose builds up in the blood and the body cannot make efficient use of its main source of fuel.

The symptoms of type 2 diabetes develop gradually. They are not as sudden in onset as in type 1 diabetes. Some people have no symptoms until complications associated with diabetes occur. Symptoms may include fatigue or nausea, frequent urination, unusual thirst, weight loss, blurred vision, frequent infections, and slow healing of wounds or sores.

Gestational diabetes

Gestational diabetes develops only during pregnancy. Though it usually disappears after delivery, the mother is at increased risk of getting type 2 diabetes later in life.

WHAT IS IMPAIRED GLUCOSE METABOLISM (IGM)?

People with impaired glucose metabolism, a state between 'normal' and 'diabetes', are at risk of developing diabetes, heart attacks, and strokes. There are two forms of impaired glucose metabolism, impaired fasting glucose and impaired glucose tolerance.

Impaired fasting glucose

A person has impaired fasting glucose (IFG) when fasting plasma glucose is higher than normal but less than the level indicating a diagnosis of diabetes.

Impaired glucose tolerance

Impaired glucose tolerance (IGT) means that blood glucose during the oral glucose tolerance test (when your blood glucose levels are measured after you are given a sweet drink) is higher than normal but not high enough for a diagnosis of diabetes. That is, the fasting glucose level is normal but the blood test following the drink is above normal. With IGT there is a one in four chance of developing diabetes.

COMPLICATIONS

The complications of untreated diabetes include blindness, heart disease, amputation and kidney disease.

PREVALENCE OF DIABETES IN TASMANIA

The Australian Diabetes, Obesity and Lifestyle Study (AusDiab), was the first national study to determine the prevalence of diabetes, obesity and other cardiovascular disease risk factors including hypertension and abnormal serum lipid profiles.

This study has shown that 8.7% of Tasmanians have diabetes.

Age adjusted prevalence rates for diabetes in Tasmania are:

- 9.0% of males
- 8.4% of females

Total IGM (includes IGT and IFG) for Tasmania is 17.5 %:

- 18.3% of males
- 16.7% of females

As Tasmania is an ageing State the comparison in statistics are adjusted to the 1998 Australian population.

Total prevalence of diabetes:

- Tasmania 8.3%
- Nationally 7.5%

Total prevalence of IGM:

- Tasmania 17.6%
- Nationally 16.3%

Total diabetes and IGM:

- Tasmania 25.9%
- Nationally 23.8%

The study has 95.0% confidence levels which brings the figures in Tasmania for:

- diabetes 8.7% (5.4 - 11.9)
- IGM 18.0% (15.3 - 20.6)
- Total (diabetes and IGM) 26.6 % (21.5 - 31.8%)

THE TASMANIAN INSULIN-TREATED DIABETES REGISTER

The Register was established with a grant from the International Diabetes Institute (IDI) and Novo-Nordisk Australia in 1983. It functioned under the University of Tasmania, Department of Community Health until January 1988. At this time, it became a Division of the newly established Menzies Centre for Population Health Research. Since that time, small grants from several drug companies and IDI have been used to continue the work of the Register.

All Tasmanian residents who use insulin to treat their diabetes are invited to register, and the Register therefore includes both Type 1 and Type 2 diabetes cases of all ages.

Information available on over 2,810 registrants includes:

- Demography (name, address, contact phone numbers, date of birth, country of birth, countries of parents' birth)

- Status (Current <65; Current>64; Deceased; Interstate; Stopped insulin; Living in nursing home; address unknown; no further contact requested)
- Source information (Tasmanian residency, insulin status, treating doctor, any hospitalisation)
- Diabetes history (date of diagnosis, current height and body weight, body weight at diagnosis, symptoms at diagnosis, family history of diabetes)
- Treatment history (initial treatment, insulin treatment history, current treatment)
- Diabetes complications (any diabetes related complications, other disorders, medications)
- Diabetes management (blood glucose monitoring, frequency of visits to doctor, diabetes educator, dietitian, podiatrist, frequency of eye checks)
- Education and employment (years of education, employment status and occupation, partner's employment status and occupation)
- General health (smoking status, alcohol intake, physical activity)

As at February 2002, of the 2,810 registrants:

- 1,630 (1,252 under 65 years of age) were living in Tasmania (for whom there was an address)
- 290 had either moved interstate, had nursing home placement or there was no longer a forwarding address
- 846 were deceased
- 34 were no longer using insulin to maintain blood glucose levels

The remaining 10 declined to complete the paperwork and were subsequently removed from the Register.

DIFFERENT REGISTERS

The National Diabetes Registry (NDR) held at the Australian Institute for Health and Welfare in Canberra, obtains its information about a person with diabetes from the National Diabetic Services Scheme (NDSS) database if the person signs the consent section on the NDSS registration form. NDSS is a Commonwealth Government program that provides people with diabetes blood and urine testing strips, syringes and needles at subsidised prices to those who register.

Unlike the NDR, the **Tasmanian Diabetes Insulin Treated Register** is a volunteer register relying on doctors, diabetes educators and pharmacies to convince the individual with diabetes of the value of joining this Register. The Register held at the Menzies Centre collects information, from people with Type 1 and Type 2 (using insulin therapy), for research into the causes, treatment, prevention and cure of diabetes as well as the availability and utilisation of appropriate community resources (e.g. diabetes educators, podiatrists).

DIABETES RESEARCH PAST AND PRESENT

Anti-Gad Study

This study began in 1992 and is currently suspended. This study obtained population-based data on the blood level of antibodies to glutamic acid decarboxylase (anti-GAD) in people with diabetes and their first degree relatives. Blood samples have been collected from over 1,259 people on the Register, and 900 of their first degree relatives. If you have diabetes, the presence of anti-GAD antibodies means that you most likely have Type 1 diabetes. Relatives who are anti-GAD antibody positive face a greater risk of developing Type 1 diabetes in the future, but the exact risk is not yet known.

Tasmanian Diabetes and Kidney Follow-up Study

In 1991 the Centre conducted a cross-sectional study, which suggested that dietary intake might be associated with the development of impaired kidney function. At that time both kidney function and dietary intake were measured in relation to other factors relating to their health and lifestyle.

This finding was followed up in 1999 courtesy of a grant from the NHMRC (National Health and Medical Research Council). The aim of this study was to:

- follow up individuals with Type 1 diabetes who had no signs of impaired kidney function in the 1991 Study
- ascertain those who had developed impaired kidney function
- compare those who did develop to those who did not develop impaired kidney function.

Tasmanian Diabetes Family Study (TDFS)

Funded by the biotechnological company, Autogen Pty Ltd through the International Diabetes Institute, this Study aimed to identify genes that may contribute to Type 2 diabetes and the metabolic syndrome, which includes hypertension, obesity and dyslipidaemia.

This Study commenced in October 1999 and was completed in August 2001. The selection criteria were to involve families that had 4 or more closely linked family members with Type 2 diabetes.

Information on more than 1,600 individuals was collected. In total 905 individuals (probands and family members) had measurements taken and questionnaire details (if returned) recorded.

Measurements involved:

- Height, weight, body mass index
- Bioelectrical Impedance Measurement
- Blood pressure.

Blood samples were collected from 860 individuals for DNA, anti-GAD and pathology analysis.

Pathology tests included:

- Serum urea, creatinine, urate, cholesterol, triglycerides, LDL/HDL
- HbA1c
- Fasting glucose or Oral Glucose Tolerance Test
- Insulin and C-Peptide
- Urinary creatinine, protein and albumin.

Questionnaires focused on medical history, lifestyle and dietary regime. Out of the 670 family members who believed they did not have diabetes, 85 were diagnosed with diabetes or IGT.

The International Diabetes Institute is currently analysing the data.

Research Into Syndrome X (R.I.S.X.)

Funded by Autogen, the Menzies Centre is working with the International Diabetes Institute to investigate the clustering of cardiovascular risk factors associated with Syndrome X, a condition which links Type 2 diabetes and an excess risk of coronary heart disease (CHD).

Metabolic Syndrome X is a group of disorders that include abnormal blood fats (such as elevated cholesterol), obesity, high blood pressure, insulin resistance (the inability to properly deal with dietary carbohydrates and sugars), glucose intolerance, and abnormally high insulin levels that all result from the primary disorder of insulin resistance. The predisposition for insulin resistance is inherited, but in an individual who inherits this tendency, the actual development of Syndrome X usually requires obesity and a sedentary lifestyle.

The cluster of risk factors associated with Syndrome X have a cumulative effect, meaning one factor can influence the development of another (e.g. obesity will sooner or later increase blood pressure) and that two or three of these factors such as high levels of cholesterol plus high blood pressure increase the risk of developing diabetes and/or heart disease far more than just one factor.

This study, which began in October 2001, aims to investigate the clustering of cardiovascular risk factors associated with Syndrome X and to identify which inherited factors linked to these risk factors are shared in large families.

The RISX study was divided into two phases. The first phase, based on the original research plan, was completed in September 2002. During this time, information about the study and its selection criteria was distributed throughout Tasmania through media and community resources.

Individuals that volunteered their family for the study were asked to complete family forms, which staff used to contact family members in order to ascertain available numbers and the level of their interest to participate.

To date there are over 2500 family names recorded on the database. The majority of these belong to seven families. The Centre's genealogist, Annette Banks, has used her

established resources to bring together family data and logically connect family branches for analysis.

As usual, Tasmanians have shown great generosity in giving their time and family information to assist research. Unfortunately some of the families that have volunteered do not meet the study criteria due to insufficient family numbers or lack of interest by family members to take part in the research. All information from these families has been stored securely on our database unless otherwise requested.

A second planned phase is yet to be completed given the high costs of genetic analysis.

Advances in the care of Tasmanians with diabetes, 1900-2000 (Feature Article)

Feature Article - Advances in the care of Tasmanians with diabetes, 1900-2000

Contributed by Maggie Lasdauskas, Diabetes Australia - Tasmania

During this century, the life expectancy and quality of life has improved greatly for Tasmanians with diabetes. In 1900, a child or adult who developed Type 1 diabetes (then known as 'Juvenile Onset Diabetes') had a short and miserable life. Treatment prolonged life through a severely restricted diet, but the disease was inevitably fatal. People with Type 2 diabetes lived longer, but their lives had little quality.

It was known that the pancreas (a gland situated near the stomach) was involved in allowing the body to use glucose. In 1910, fifty or more years before the first successful organ transplantation, Dr John Ramsay, at the Launceston General Hospital, undertook a pancreas transplant. His female patient had Type 2 diabetes (then known as 'Mature Onset Diabetes'). For some days after transplantation, the woman's urine was free of glucose, then the diabetes returned as her body rejected the pancreas. Today, Tasmanians benefit from the same operation, which tissue typing and immune system- suppressing medications make successful.

In 1922, insulin was discovered and became available in Australia. Insulin in 1922 was not the pure, easily measured medication we know today. Needles required constant sharpening and syringes were boiled. Painful abscesses caused by injections were common. As only short-acting insulin was available, injections were needed several times a day.

Until the 1940s when oral drugs were discovered, people with Type 2 diabetes also injected insulin. Around this time, research began into the effects of diet on diabetes.

A simple urine test was developed in 1956, enabling people to check their glucose levels.

By the 1960s, Tasmanians were able to check their blood glucose levels using 'Dextrose Sticks', a more accurate method of checking control. For parents of children with diabetes, this was an accurate way to see what was happening to their child, and relieve some of their fear and anxiety.

Throughout the 1970s, many scientific and medical advances were made. Insulin became

highly purified, nutrition was recognised as a cornerstone of diabetes care, the first blood glucose meters appeared on the market, and blood testing strips became available on the National Health Scheme.

By the 1980s, the pace of change was increasing. More Tasmanians tested their blood glucose levels at home. 'Human' insulin improved the action and availability of insulin. Tablets to control Type 2 diabetes improved and there was a greater choice than before. By the middle of the decade, Diabetes Nurse Educators were appointed to all major Tasmanian hospitals. Diabetes Australia administered the 'National Diabetics Supply Scheme' for the Commonwealth Government to ensure costs of diabetes were kept to a minimum. In 1986, the Menzies Foundation set up the Register for Diabetes in Tasmania (which later expanded to become the National Register for Diabetes).

Throughout the 1990s, there has been a massive increase in knowledge about diabetes and its care. Improved technology has resulted in smaller, cheaper, more accurate meters; and easier injections due to smaller, sharper needles and disposable syringes. Pen injectors make insulin delivery more convenient. Insulin is now available in a variety of lengths of action. Research into nutrition and exercise has relieved dietary stress, a 'sugar-free' diet is no longer expected or desired in order to achieve good control. The 1993 United States 'Diabetes Control and Complications Trial' and 1998's 'United Kingdom Prospective Diabetes Study' have provided doctors with information. This ensures they have proven guidelines to work with when helping people live well in the presence of this incurable, but treatable disease. Tasmanians with diabetes can now look forward to a life as long and fulfilling as the rest of the population.

Causes of death in Tasmania since 1900 (Feature Article)

Feature Article - Causes of death in Tasmania since 1900

OVERVIEW

In 1900, the main recorded cause of death for Tasmanians was old age, accounting for 13.2% of deaths, followed by diseases of the circulatory system (12.8%), diseases of the nervous system (11.7%), diseases of the respiratory system (9.3%), tuberculosis (8.4%) and diseases of the digestive system (6.7%). Accidents (excluding motor vehicle accidents, suicide and homicide) accounted for 5.5% and at this time, cancer accounted for only 4.9% of all Tasmanian deaths.

By 1925, diseases of the circulatory system and diseases of the respiratory system had emerged as main causes of Tasmanian deaths, accounting for 15.5% and 10.6% respectively, followed by cancer (10.2%). Tuberculosis fell to 6.9% while old age was responsible for 8.2% of total deaths.

By 1950, diseases of the circulatory system had increased by 125.3% to be the main cause of death, accounting for 34.9% of all deaths, followed by malignant neoplasms which now accounted for 13.1% of all deaths. The third highest major cause of death was cerebrovascular disease, accounting for 10.8% of all Tasmanian deaths (figures for diseases of the circulatory system for 1900, 1925 and 1950 do not include cerebrovascular disease).

A similar pattern followed for 1975, with diseases of the circulatory system now accounting for 52.9% of all deaths. Heart disease accounted for 67.3% of this figure, while cerebrovascular disease accounted for 25.2%. Malignant neoplasms now accounted for

16.4% of all deaths. Motor vehicle accidents (including both traffic and non-traffic accidents) at this time accounted for 3.8% of all deaths. Diseases of the respiratory system as a main cause of death had been declining since 1925. It now accounted for just 7.5% of all Tasmanian deaths.

While diseases of the circulatory system remained Tasmania's leading cause of death in 1997 (1,614 deaths), this was 152 fewer than the number in 1975. As a proportion of total deaths, diseases of the circulatory system accounted for 42.4%, with 68.2% of these attributable to heart disease and 22.6% to cerebrovascular disease.

Since 1975, the number of deaths due to malignant neoplasms increased from 546 (16.4%) in 1975 to 1,058 (27.3%) in 2001.

In 2001, the number of deaths attributable to diseases of the respiratory system accounted for 8.9% of all Tasmanian deaths. External causes of morbidity and mortality accounted for 6.3% of all deaths. This includes suicides which accounted for 1.6% of all deaths and transport accidents which accounted for 1.4% of deaths.

MALE AND FEMALE COMPARISONS

In 1900, while old age was the main cause of death for males (15.1% of all male deaths), it was diseases of the nervous system at 13.6% that was the primary cause of death for females. Diseases of the nervous system was the third ranked cause of male deaths at 10.3% of all deaths. Diseases of the circulatory system was the second ranked cause of death for both sexes.

By 1925, diseases of the circulatory system had become the main cause of death for males and females. While in 1900, females had a higher proportion of deaths attributed to diseases of the circulatory system than males, by 1925 the situation was reversed. In 1925, 17.0% of Tasmanian male deaths related to diseases of the circulatory system compared with 13.7% of female deaths.

Diseases of the nervous system remained a significant cause of death for females in 1925, accounting for 11.6% of deaths. However for males, diseases of the nervous system failed to rank in the top five leading causes of death, although the total number of male deaths (111) exceeded the number of female deaths (106).

Diseases of the respiratory system remained a significant cause of death for males (11.2%) and for females (9.8%). 1925 also saw the emergence of malignant neoplasms as a significant cause of death, approximately double the proportion of deaths in 1900 at 10.5% for males and 9.8% for females.

The period between 1925 and 1950 saw the emergence of diseases of the circulatory system as the primary cause of death for both males and females. In 1950, 36.3% of male deaths and 33.2% of female deaths were attributed to this cause (479 recorded male deaths in 1950 compared to 184 in 1925, and 381 female deaths in 1950 compared to 125 in 1925). Malignant neoplasms continued to grow as a significant cause of death, increasing to 14.3% of all female deaths and 12.1% of male deaths.

The previously significant diseases of the nervous system disappeared as a major cause of female deaths by 1950, although the number of female deaths in 1950 (169) was higher than that recorded in 1925 (106). Diseases of the respiratory system also declined in importance, accounting for 8.8% of male and 7.8% of female deaths in 1950.

By 1975, diseases of the circulatory system were responsible for the majority of all female

deaths (56.9%). While proportionately more females died of diseases of the circulatory system, males also followed the trend with 49.6% of all male deaths attributed to this cause in 1975. The number of male deaths (918) however, exceeded the number of female deaths (848).

As a percentage of all deaths, malignant neoplasms marginally increased for both males and females in the period 1950 to 1975. The proportion of males dying from respiratory diseases in 1975 changed little from the 1950 level; however, the number of recorded male deaths in 1975 (165) was higher than that recorded in 1950 (116). For females the proportion of deaths declined from 7.8% to 5.6% (89 recorded deaths in 1950 and 84 recorded deaths in 1975).

At the beginning of the century, diseases of the circulatory system were the primary cause of death of Tasmanians. The proportion of deaths due to diseases of the circulatory system for females (40.7%) exceeded that of males, (35.9%) in 2001 and was significantly lower than 1975 levels. The recorded number of female deaths in 1975 from diseases of the circulatory system was 56.9%, while it was 49.6% for males.

With improvements in treatment, education and awareness of risk factors associated with heart disease all contributing to the relative decline in the proportion of diseases of the circulatory system, malignant neoplasms significantly increased as a cause of death. In 2001, malignant neoplasms accounted for 29.2% of all male deaths and 25.4% of female deaths. Respiratory diseases remained the third ranked cause of death at 9.7% for males and 8.1% for females.

Note: The classifications used to determine cause of death have changed over time. Descriptions of cause of death used in this article are based on classifications used at the respective dates.

For the 1975 and 2001 figures, disease of the circulatory system includes both heart disease and cerebrovascular disease. Figures for diseases of the circulatory system for 1900, 1925 and 1950 do not include cerebrovascular disease.

Health in Tasmania since 1900 (Feature Article)

Feature Article - Health in Tasmania since 1900

Contributed by the Department of Health and Human Services

Health care issues have been a major part of life in Tasmania over the past hundred years although the major health concerns of 1900 would be barely recognisable in a list of the major health concerns in the year 2000.

In 1900, major surgery was at an early stage of development in Hobart and Launceston, with the larger rural centres falling somewhat behind. A turn of the century history of the local hospital at Queenstown proudly records that a Mt Lyell Company engineer successfully treated a man with a partially severed foot.

That same history reported industrial injuries, burns, epidemics of typhoid fever, diphtheria, scarlet fever, influenza and midwifery services as being major health concerns of that small but thriving remote part of the State.

Finding sufficient money to support health services has always been a concern, and statements along the lines of 'Institute X is in serious financial difficulties' appear almost without relief in any record of Tasmania's health service throughout the 20th century.

INFECTIOUS DISEASES

Numerous advances have been made in health services throughout the century. The prevention, treatment and control of infectious diseases is arguably the area in which the most spectacular gains have been made. Immunisation is the only way of providing effective prevention against tetanus, diphtheria, whooping cough, poliomyelitis, measles, mumps and rubella, all of which were well-known, feared and often fatal infectious diseases at the turn of the century. While only smallpox has been totally eradicated, the other infectious diseases are now a relatively minor cause of illness and death among children. Immunisation also prevents the relatively recently discovered disease of haemophilus influenza Type B (HIB) and hepatitis Type B. The era of isolation wards and even special hospitals for the treatment of infectious diseases has been replaced by an era in which sophisticated computer-based reminder systems, and partnerships with local government encourage parents to maintain full immunisation coverage of their children.

Wide use of antibiotics from the Second World War years, the poliomyelitis epidemics of the 1940s and 1950s, the emergence of new types of hepatitis infections, the tragic and still largely untreatable consequences of HIV/AIDS and the rise and fall of sexually transmitted diseases have been other major features of infectious diseases throughout the century.

TECHNOLOGY

Technology in health at the turn of the century extended little beyond the use of x-rays in the diagnosis of fractures and some other conditions.

The use of radiation to treat cancer was introduced into Tasmania in the 1920s under the pioneering head of Dr W. P. Holman at the Launceston General Hospital. The treatment rays used for radiotherapy are similar to, but much more powerful and penetrating than, those used for taking x-ray pictures for diagnosis.

The early radiotherapy treatment machines have been progressively superseded by highly sophisticated linear accelerator equipment which enables precise doses of radiation to be directed to precise areas of the body to destroy cancerous cells.

Similar huge advances have been made in the use of radiation for diagnostic purposes, and over the last twenty years of the 20th century in the use of powerful electromagnetic fields for diagnostic imaging.

Technology now forms a major part of almost every specialist branch of medicine.

Mental health services (Feature Article)

Feature Article - Mental health services

Contributed by Mary Blackwood, former State Manager, Mental Health

At the turn of the last century, mental illness was regarded as a fortunately rare problem to be managed in an institutional rather than a societal way. Public mental health care revolved

almost entirely around treatment in residential complexes unashamedly termed lunatic asylums. Society's concern was only that these asylums be managed in a humanitarian, responsible and kindly way, with proper attention to the physical needs of the unfortunate inmates. Although the early part of this century saw the flourishing of profoundly influential schools of thought in psychiatry and psychology and these (such as Freudian theory) relied on the individual psyche as the guide to disorder, the public provision of service was overwhelmingly institutional.

In Tasmania, the Hospital for the Insane at New Norfolk had been established as a Lunatic Asylum, an attachment to the Invalid Hospital for convicts, by 1834.

In the first half of this century and a little beyond, the reality and desirability of institutional life was, it seems, simply unquestioned. The imperatives were about improvements and expansion, staffing, humanitarian treatment, and resident comfort. Overcrowding and increasing demand were constant issues; numbers were high (522 in 1916; over 600 in the 1940s), and the solutions were to provide the same kind of service, but to provide it better.

In the 1940s a Parliamentary Standing Committee considered the development of a new hospital to replace the old; new wards were constructed and occupied in 1957 and 1959, with a nurses home and library soon to follow.

By the early 1960s the institutional complex was an almost complete community within its local community, New Norfolk. Tailoring, laundry, bootmaking, hairdressing, day activity and industrial therapy, mortuary, pharmacy, catering, radiology, recreation and occupation were all provided on site.

Yet the germs of modern service philosophies are to be found even in the very early days of the asylum and in the subsequent developments. Segregation of people with intellectual disability from those with mental illness was always sought and was underlined by legislation in 1922; the idea of recovery, and integration back to the community was embodied in the establishment of Millbrook Rise in 1934 as a convalescent hospital for mentally disturbed ex-service men and women. Millbrook acted also as a 'halfway house', a much later concept, for people in transition from the mental hospital itself.

The landmark date for the establishment of modern services, however, is 1968, when the Mental Health Services Commission was set up in response to perceived inadequacies in psychiatric services throughout the State. The focus began to shift almost immediately. In its very first annual report, the Commission recorded the creation of a Board of Management for the mental hospital (by now called the Royal Derwent Hospital), the establishment of a Chair in Psychiatry, and of a Professional Psychiatric Unit, the creation of acute psychiatric units across the State in general hospitals, and the establishment of a Combined Childrens Centre.

The Commission sowed the seeds of modern service: early detection, extended hours services, general practitioner liaison and involvement of non-government organisations are all included as part of the 1968 directions for mental health. Yet in 1968 of the Commission's budget allocation of \$2,434,500 the Royal Derwent component was 89%, and there were 930 patients accommodated there.

The task, clearly, was to shift the balance and the resources in favour of the new community directions, and there were only two ways to do this, given the perennial public sector axiom that new State funding was never to be expected. The first way was to reduce admissions. From 1974, when the Commonwealth Government funded community mental health teams, reliance on the institution reduced and admissions dropped; to the present day admissions to the institution are regarded as a last resort. The second way was to

provide specific alternative facilities and ensure direct transfer of residents and ward closure.

This occurred with the opening of rehabilitation and psychogeriatric services in Hobart in 1987 and the transfer of residents; Subsequently the Howard Hill Centre in Longford and Curraghmore in Devonport opened; nursing homes began to take elderly patients, and community centred psychiatric services expanded. The twin strategies have seen the institutional population now dropped to 90, from 573 in 1970.

In the new century there will be no institution as such; but there will be a range of small scale residential services to meet the needs the institution once met.

In 1989 the Mental Health Services Commission was integrated into the Department of Health Services as part of a national trend towards 'mainstreaming', the alignment of mental health with health generally. Mental Health, it is claimed, has outgrown its need for special attention because its place is so firmly assured. Intellectual disability services were formally structurally separated to become part of the wider disability framework, as first recommended in 1962 and progressively implemented by the Mental Health Services Commission.

In 1992 the State's directions towards mainstream care, community integration and legislation reform were given huge impetus by the National Mental Health Strategy. In the recognisable sequence of outrage, enquiry and reform which has often characterised major change (for example in Tasmania in 1883), the Human Rights and Equal Opportunity Commission inquired into mental health services across Australia, and the Commonwealth Government established reform and incentive funding (\$1.2m annually for Tasmania by 1997-98) as well as substantial national project funding in areas such as community awareness. Tasmania has participated fully in all these developments, with a strategic plan resting on the key components of promotion, prevention, reduction of the impact of mental illness, consumer rights, quality and partnerships.

In parallel, the State's own reform agenda has seen the establishment of local residential and community facilities in a network of care across the State, and 70,000 Tasmanians have accessed those services in the last decade.

These changes, though gradually implemented, represent a radical change in mental health care, from custodial to community, from containment to participation and from congregate asylum care to specialised individual treatment.

The changes rest on two foundations: a growing knowledge base and massive social change. The certainty is that both will continue into the next century.

Glaucoma Inheritance Study (Feature Article)

Feature Article - Glaucoma Inheritance Study

Contributed by Sue Ashlin, Menzies Centre for Population Health Research

The key to early diagnosis of glaucoma may lie with the Glaucoma Inheritance Study in Tasmania.

Glaucoma is a disease in which the eye's drainage system becomes obstructed. This

causes pressure to rise, damaging the optic nerve at the back of the eye which leads to progressive loss of side vision and, if untreated, can lead to total blindness.

It is believed that up to 100,000 Australians may suffer from glaucoma, with up to half of them not knowing they have the disease. In Tasmania, there are thought to be 3000 to 4000 glaucoma sufferers.

Detecting glaucoma in its early stages without the need for complex and expensive investigations would be a major advance and may become possible through the Menzies Centre's Glaucoma Inheritance Study in Tasmania (GIST).

The GIST is examining the premise that the principal factor used to detect glaucoma should be family history. Previously, a person with a family history of glaucoma was thought to have only about a 10% chance of developing the disease.

However, studies of family trees in Tasmania suggest that this figure may be an under-estimation of the true risk. When several relations are affected, researchers believe the risk may be as high as 50%.

The GIST has been able to construct family trees of distantly related Tasmanians and to build up profiles of those families to see whether particular individuals are likely to develop glaucoma.

From these pedigrees, researchers involved in the study hope to find a common gene that is responsible for glaucoma. If a common link to a particular gene is found, a simple blood test may be developed to test for glaucoma. It is also possible that new pharmaceutical treatments may be created as a result of a greater understanding of the gene's function.

Youth suicide in Tasmania (Feature Article)

Feature Article - Youth suicide in Tasmania

Contributed by Judith Nguyen, Department of Community and Health Services

Tasmania has been reported as having one of the highest suicide rates in the country.

The figures for Tasmania are too small to reliably calculate rates, or to break down into sub-groups such as non-English speaking background, or Aboriginal and Torres Strait Islander.

Two facts that consistently stand out however, are that between three and four times as many males as females complete suicide, and that males are at greatest risk between school leaving age and early middle age.

In Tasmania, the Mental Health Program of the Department of Community and Health Services monitors the incidence of suicide, and coordinates an interdepartmental response through the Suicide Register Steering Committee (SRSC). This committee will also liaise with regional groups concerned with reducing youth suicide and is chaired by the State Program Coordinator, Mental Health.

The Chair of this committee and a representative from the Rural Youth Organisation of Tasmania are also member of the Federal Health Minister's Youth Suicide Prevention Advisory Group (YSPAG).

This group is responsible for providing advice to the Federal Government's Youth Suicide Prevention Strategy. This strategy will run until June 1999. The strategy has allocated \$31 million to activities addressing youth suicide prevention. From this amount, Tasmania will receive:

- \$270,000 to enhance telephone counselling services to rural and regional youth over a three year period.
- \$100,000 to educate and train professionals in youth suicide prevention in Tasmania over two years.
- \$14,000 over two years to provide input into a National Stocktake of activities relating to information sharing, data collection, co-ordination and evaluation, which up to now, have not been addressed in a strategic way.

SUICIDE BY SELECTED AGE GROUPS, Tasmania(a)

	15-19 years	20-24 years	All others	Total persons
	no.	no.	no.	no.
1989	6	7	46	59
1990	6	9	55	70
1991	4	8	55	67
1992	8	17	72	97
1993	3	9	70	82
1994	4	13	56	73
1995	-	8	56	64
1996	7	4	60	71

- nil or rounded to zero

(a) There is occasionally variance between the figures presented here and figures found in other ABS publications. This occurs because the ABS needs to collect figures before all Coroner inquiries have been completed. This table is a summary of Coroner's verdicts of suicide.

Source: Department of Community and Health Services.

Australian Red Cross blood transfusion service (Feature Article)

Feature Article - Australian Red Cross blood transfusion service

Contributed by the Blood Transfusion Service, Tasmanian Division

The Australian Red Cross Blood Services aims to provide a safe blood supply for both the expected and the emergency needs of Tasmanians. Maintaining a safe, high quality supply of blood and blood products is a far more complex operation today than in past years. Both the screening of donors and the testing of blood, once collected, are operations that need to be carried out with adherence to stringent safeguards.

AUSTRALIAN RED CROSS TRANSFUSION SERVICE, TASMANIA ACTIVITY - 1993-94

Number

Individual donors	11,587
Donations collected	22,069
Units of plasma for separation into other products	20,162

Source: Australian Red Cross.

There are Red Cross blood centres in Hobart, Launceston, Devonport and Burnie. Purpose-built laboratories were opened in June 1991 and a reorganisation of the different departments State-wide was undertaken. Blood throughout the State is now distributed from Hobart.

In 1995 Blood Services Tasmania obtained the Certificate of Registration to the standard of Quality ISO 9002/AS 3902/NZ 9002, the first Blood Service in Australia to achieve this level of accreditation.

Donors are interviewed and assessed before the donation is taken. It usually takes about half an hour from the time the donor fills in the necessary forms until the cup of tea, coffee or milkshake is provided by the volunteers at the end of the donation.

DONOR BLOOD GROUPS, AVERAGE OCCURRENCE

Type	Proportion %
ABO and Rh(D)(a)	
O Pos	36
O Neg	9
A Pos	32
A Neg	8
B Pos	9
B Neg	2
AB Pos	3
AB Neg	1

(a) Rhesus factor: positive has the Rhesus antigen factor; negative does not have it.

Source: Australian Red Cross.

A healthy person can donate whole blood about every twelve weeks. Whole blood donations from registered donors are split into several components, such as red cells, platelets and plasma.

PRODUCTS SUPPLIED BY BLOOD SERVICES TASMANIA, 1993-94

Product group	Units shipped	Active components
Albumin solutions	6,868	151,626 grams
Intravenous immunoglobulin	1,346	14,775 grams
Factor VII (clotting factor)	4,651	1,162,750 IU
Intramuscular immunoglobulin		
Normal	2,377	
Specials		
Anti D	1,593	
Tetanus antibodies	1,164	
Other	104	
Red cells	19,485	

Platelets	5,992
Fresh frozen plasma	1,793
Cryoprecipitate	201

Source: Australian Red Cross.

Autologous blood collection was commenced in the early 1980s. This involves the collection of a person's own blood prior to undergoing elective surgery. The blood collected this way can only be used for the particular person who has donated it.

In 1991 the plasmapheresis service began. Using sophisticated equipment, the donor's blood is taken, passed through a machine that removes only the plasma, and is then returned to the donor. As they do not lose their red blood cells, plasmapheresis donors can donate more frequently than whole blood donors. The process usually takes about forty minutes.

A clinical service is also provided to hospital-based clinical oncology services by providing an instrument-based procedure for cell removal from the blood stream. This allows peripheral blood stem cells to be harvested. These can be used to transplant in place of bone marrow.

At the accreditation laboratory blood screening tests are performed, ranging from blood grouping; testing for antibodies to human immunodeficiency virus type I and II, hepatitis C, and human T leukaemia virus; testing for the hepatitis B virus and screening for syphilis.

In 1992 the Australian Bone Marrow Donor Registry was initiated, which allowed volunteers to have their names placed on a register of people willing to donate bone marrow for use in the treatment of leukaemia. The Donor Centre and Tissue Typing are undertaken by the Australian Red Cross Blood Services Tasmania on behalf of the Australian Bone Marrow Registry. Tissue Typing is also performed by the laboratory for clinical patients within Tasmania.

Blood is released from quarantine after the necessary tests have been performed and found satisfactory. Then blood and blood products are distributed throughout Tasmania to hospitals, doctors and pathology departments. Great care needs to be taken in the handling of the products to ensure they are maintained in the optimum condition.

The Blood Service is often taken for granted, but a large scale emergency can highlight the importance of maintaining a regular supply of blood and blood products. Victims of accidents or patients undergoing prolonged treatment appreciate the generous gift of life. The voluntary donors' reward is the knowledge that they perform a vital service.

Heart and Stroke Facts 1995 (Feature Article)

Feature Article - Heart and Stroke Facts 1995

In July 1995, the National Heart Foundation of Australia released a report titled 'Heart and Stroke Facts 1995'. Heart attack and stroke remain the major cause of death in Australia and people living in Tasmania and the Northern Territory are more likely to die of a heart attack than people living elsewhere in Australia.

Heart and blood vessel disease kill one Australian every 10 minutes, on average. The

estimated annual cost to the economy of cardiovascular disease is approximately \$3.5 billion.

During the 1980s women gained, on average, an extra three kilograms in weight and men an extra two kilograms. Medical experts believe Australians are eating more junk food, which is a significant factor. Also, while smoking levels continue to decline, more than one-quarter of the population still smoke, seriously increasing their risk of heart disease and other health problems. One in six middle-aged Australians have high blood pressure.

Dr Andrew Tonkin, Medical Vice-President of the Heart Foundation's Victorian Division, said at the launch of the report that, despite gains in cutting heart disease in Australia, the realities are grim. He said, 'Cardiovascular disease is still the commonest cause of death in this country and in 1993 accounted for about 44% of all deaths'.

Dr Tonkin called for more government funding for research into heart disease. He said that health campaigns should concentrate on the parents of the future-young people between 18 and 24 years, who were the greatest consumers of junk food.

During the 1980s cholesterol levels remained stagnant. The Heart Foundation's National Medical Director, Dr Paul Magnus, said that all adult Australians should know their cholesterol levels and be re-tested every five years.

Based on figures from the ABS and the Heart Foundation, on average in 1993, 31 Australians under the age of 70 years died prematurely from heart disease every day. For young and middle-aged Aboriginal Australians, death rates from heart disease were 10 to 20 times higher than for non-Aboriginal Australians.

Mt Wellington tower demolition (Feature Article)

Feature Article - Mt Wellington tower demolition

The demolition of the obsolete 104-metre steel lattice broadcasting tower on Mt Wellington in 1997 marked the end of the National Transmission Agency's Hobart Tower Project. The tower was demolished by cutting through 2 of the supporting legs and pushing it over with an hydraulic ram. Rehabilitation of the site included removal of steel sections, return of the original soils and the planting of plants native to the summit (including Poa Grass and Helichrysum).

Construction of the old tower commenced in February 1959 on a one-hectare site owned by the Hobart City Council. ABC TV transmissions commenced from the tower in June 1960. Before decommissioning, the tower serviced ABC TV, FM radio, SBS and Southern Cross TV. As well as transmitting broadcast services to Hobart households, the facility transmitted to translators in the west, south and east for retransmission.

The planning to replace the tower began in 1991 after it was recognised that the weather conditions on Mt Wellington and the tower's design would no longer accommodate planned additions to transmission services.

The new tower stands almost 131 metres high. It has 18 rock anchors installed in dolerite bedrock-some 15 metres deep. Above ground there is a 67-metre cast-concrete shaft below a 64-metre steel superstructure, which supports 3 broadcasting antennas and an internal lift. The steel superstructure and broadcasting antennae are covered with a fibreglass radome

to shield the antennas from the weather.

The 3 antennas include:

- Band 1 antenna transmitting VHF TV for ABC on Channel 2;
- Band 11/111 antenna transmitting FM radio including SBS, ABC Classic and Triple J, 7HO and TTT; and
- Band 1V/V transmitting UHF TV for SBS and Southern Cross.

A section of the steel superstructure has also been set aside for use in radiocommunications services.

History of Tasmania's population 1803-2000 (Feature Article)

Feature Article - History of Tasmania's population 1803-2000

The first human inhabitants of what is now Tasmania arrived more than 35,000 years ago, crossing the land bridge that then connected Tasmania to the Australian mainland. The total population, before white settlement, has been estimated at between 5,000 and 10,000.

White settlement began in 1803 to secure British strategic interests against the French. In keeping with the penal nature of the early settlement, most of the population were convicts or government officials. At the Census of 1847, just over 50% of the total population of 70,000 were, or had been, convicts. Less than 20% were free immigrants.

Until the mid-nineteenth century, Tasmania experienced a fairly rapid build-up of population. However, in the early 1850s this rapid rate of population increase slumped. This decline was due to two major factors: the discovery of gold in Victoria in 1851, which led to a large-scale emigration of Tasmanians, and the ending of transportation of convicts in 1853. This decline was reversed in the early 1870s, partly due to a growth in markets for Tasmanian primary products, and also important tin and gold discoveries in Tasmania. Between 1861 and 1876, the population increased from 90,000 to 105,000. The next 15 years to 1891 saw the population reach 151,150, an annual rate of increase more than double that of the previous period.

The effects of economic depression in Australia in the 1890s, while severe, were eased somewhat in Tasmania by the silver and copper mining boom on the West Coast. Tasmania's relative prosperity was reflected in a net migration in excess of 4,000 per year from 1896 to 1899. While federation in 1901 meant free access to Australian mainland markets for primary producers, many small manufacturers faced strong competition from Australian mainland firms.

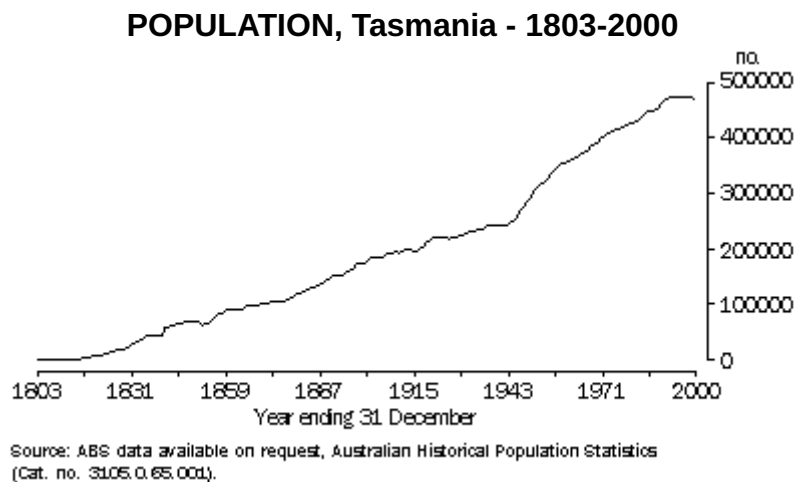
Economic stagnation, exacerbated by the decline of the West Coast mining boom, was reflected in a drift of people to the mainland. Attracting manufacturing industries through the provision of cheap hydro-electric power came to be seen as a way out of the economic gloom. While this was partly successful, it was not wholly sufficient, especially during the economic depression of the late 1920s and 1930s. Rural industries, always important to Tasmania's economic well-being, were particularly affected by the depression. In the 35

years between 1900 and 1935, Tasmania's population grew at less than 0.7% per year.

After World War II, Tasmania shared in the prosperity of the Australian economy. The post-war baby boom and gains from overseas immigration resulted in an annual population increase of 1.5% in the 35 years from 1945 to 1980, more than double the pre-war rate. Tasmanians made up 2.9% of the total Australian population at 30 June 1976.

In the 1980s, Tasmania's population still lagged behind the Australian mainland States. Tasmania's annual growth rate averaged 0.8% while the Australian growth rate averaged 1.5%. As a result, the proportion of the total Australian population living in Tasmania decreased to 2.7% at 30 June 1989.

In the 1990s, while the Australian growth rate averaged 1.2% in the first eight years, Tasmania averaged only 0.5%. With the annual rate below 0.5% since the beginning of 1993, Tasmania's proportion of the total Australian population at 30 June 2000 decreased to 2.5%.



Population Issues in Contemporary Australia: A Tasmanian Perspective (Feature Article)

Feature Article - Population Issues in Contemporary Australia: A Tasmanian Perspective

(Author: Professor Graeme Hugo)

Professor Graeme Hugo's paper Population Issues in Contemporary Australia: A Tasmanian Perspective

Mature aged participation in sports and physical activities in Tasmania (Feature Article)

Feature Article - Mature aged participation in sports and physical activities in Tasmania

Contributed by Keryn Welch, Office of Sport and Recreation

The structure of the Australian population is changing, with a trend toward ageing marking a change in participation in sport and recreation activities. The Australian Bureau of Statistics (ABS) projects a significant reduction in the proportion of the Tasmanian population in the 5-34 years age group, with proportionately higher increases in the 45 years and over age group. This is documented in the ABS publication Population Projections, Australia 1999 to 2101 (Cat. no. 3222.0).

In June 2001 there were more than 178,000 Tasmanians aged 45 years and over, representing 38% of the population. More than 14% of the population were people aged 65 years and over. The median age of the Tasmanian population (using Population Projections, Series II) is expected to increase from 36.1 years in 1999 to 41.1 years in 2011 and 53.2 years in 2051. This population group is not homogeneous; differences in general health, abilities, skill levels and activity preferences are observed between age groups and will impact on future sport and recreation program design and implementation.

Life expectancy at birth has increased for both men and women over the past 30 years. In Tasmania, based on 1998-2000 mortality experience, a 65-year-old male could expect to live a further 16.9 years on average, and a 65-year-old female a further 19.8 years. The Australian Institute of Health and Welfare publication 'Australia's Health 2000' reports that from the age of 75 years both men and women experience high levels of profound or severe core activity restriction. These levels increase to over half of the population at the age 85 years and over. The main disabling conditions include arthritis, problems relating to the circulatory system, and musculoskeletal conditions.

In Tasmania, Glamorgan/Spring Bay, Break O'Day and Glenorchy local government areas (LGA) have the highest percentage of people aged 65 years and over (up to 18%).

HEALTH BENEFITS OF PHYSICAL ACTIVITY

Involvement in physical activity for older adults, including the frail and very old, has the same benefits as it does for other age groups. Specific health issues for the older population include bone health, osteoporosis, postural stability and the risk of falling. Physical activity plays a role in both the prevention and management of many chronic illnesses, including cardiovascular disease, diabetes, lung disease, obesity, osteoporosis and some forms of arthritis. In addition, weight-bearing activity can increase mobility, independence and reduce the risk of falls.

Regular, moderate physical activity may also contribute to psychological benefits including improved mental functioning, self-confidence, and alleviation of depressive symptoms.

The Australian Sports Commission states that 'regular physical activity is associated with a 40% decreased risk of losing mobility for older people' (ACS & DVA, 2001). As a result of physical activity, quality of life is increased, fear of falling is reduced and people can live independently for longer.

As adults get older they experience muscle atrophy and bone weakening, which results in loss of function and increases the risk of injury. Evidence suggests that involvement in exercise such as walking, gardening, swimming, progressive resistance and Tai Chi can increase the metabolic rate, muscle strength and balance and substantially reduce the risks of injury. The end result is increased quality of life.

The key group where risk factors for high blood cholesterol, high blood pressure, overweight and physical inactivity markedly increase is 45-54 year olds. Therefore in the ten, or even

twenty years preceding this age group, awareness of the dangers of inactivity, poor dietary and lifestyle choices must be a priority for sport and recreation advocates.

PARTICIPATION IN SPORT AND RECREATION

The National Physical Activity Guidelines for Australians produced by the Australian Department of Health and Ageing recommends that all Australians participate in at least thirty minutes moderate intensity physical activity every or most days.

Participation in sport and recreational activities decreases with age, both in the number of people participating and in the rate of participation. The highest participation rates are in the 18-24 years age group, and the lowest in the 65 years and over population. This pattern occurs in nearly all States.

The ABS publication Participation in Sport and Physical Activities, Australia 1999-2000 (Cat. no. 4177.0) revealed that 30.7% of Tasmanians aged 65 and over participate in sport and physical activities in contrast to 68.9% aged 18-24. The second lowest participation rate was recorded for the 45-54 and 55-64 age groups. These figures were lower than the national average.

Male participation rates in Tasmania were generally higher than female participation rates with the exception of the 18-24 and 45-54 age groups. The overall male participation rate (53.3%) was higher than the overall female participation rate (49.5%).

The greatest difference between male and female participation rates was found in the 65 and over age group where only 26.0% of women participated in contrast to 37.0% of men. The participation rates for women aged 35-44 years and for men aged 45-54 years were the lowest in the country.

PREFERRED TYPES OF PARTICIPATION

In 1999-2000 the Office of Sport and Recreation (OSR) conducted a voluntary study on participation in sport and recreation activities in Tasmania. The purpose of this study was to observe and document the physical activity levels and preferences of Tasmanians, the frequency of participation and the factors contributing to the choices people make.

The OSR survey revealed that the four most popular activities for people aged 65 and over were recreational walking, lawn/indoor bowls, fishing and golf. For people aged 55-64 the four most popular activities were recreational walking, fishing, swimming/diving and golf. Similarly for people aged 45-54 years and over recreational walking, fishing, swimming and bushwalking were popular. These findings were consistent with ABS data.

The main motivations for participating in sport and recreation activities for people aged 45 and over were fitness/health/exercise and fun and enjoyment. Further, the main reason for discontinuing activity for people aged 45 and over was due to age, the second most frequent reason was ill health for people aged 55 and over, and no time for people aged 45-54.

This study revealed that the main reasons for discontinuing activity for people aged 55 and over were age and ill health. People aged 45-55 identified age and a lack of time as their main reasons for discontinuing activity.

Although nationally there has been a decrease in participation in organised activities (e.g. sport) it appears that the older age groups prefer to participate in sporting activities, although a large percentage of these people were not members of formal clubs or associations.

A study on exercise adherence identified that older adults who adhere to exercise prescriptions were usually '... individuals who were in better physical condition at baseline, had a history of a physically active lifestyle, were non-smokers, and had higher exercise self-efficacy' (Martin and Sinden, 2001). These findings were consistent with the findings of similar studies on younger adults.

EFFECTIVE INTERVENTIONS

It is well documented that interventions that increase the levels of moderate intensity activity and building muscle strength and flexibility in older adults have positive effects on general health and wellbeing. The recent article 'Getting Australia active: towards better practice for the promotion of physical activity' suggests the following interventions for our older population, including people classified as frail and very old:

- longer duration of activity to achieve metabolic and body composition changes such as one hour of walking, swimming or gentle exercise three times each week;
- gentle exercise such as Tai Chi combined with household work such as walking and gardening can improve muscle strength and balance;
- strength training may be an important adjunct to aerobic exercise for people who have not had to use muscle strength over the years; and
- activity modifications may need to be made for people with mobility problems, arthritis, dementia and visual impairment.

Sport and recreation service providers need to design accessible, affordable and flexible opportunities that are tailored to meet the needs of this population group. Emerging issues for the sport and recreation industry include:

- developing activities aimed at meeting the needs of the mature market, including masters sports;
- providing convenient ways of accessing facilities through cost considerations and transport;
- encouraging the creation of sport and recreation opportunities;
- avoiding stereotyping of older people in the media;
- acknowledging and encouraging involvement in volunteer activities; and
- continuing nutritional and healthy lifestyle promotions.

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Ecotourism in Tasmania (Feature Article)

Feature Article - Ecotourism in Tasmania

HISTORY AND DEVELOPMENT

Nature has historically been a cornerstone of Tasmania's tourism appeal and featured in its earliest promotion as a holiday destination in the late 1800s. However, the State's nature-based and ecotourism industry did not begin to emerge as an entity until the mid-1980s, following on from substantial development of the National Park network in the 1970s and 80s. Also contributing to the emergence of the ecotourism industry was an upsurge in environmental politics that saw the world's first green political party, the United Tasmania Group, formed in an attempt to prevent the flooding of Lake Pedder.

Ecotourism is considered to have certain key characteristics:

- a natural area base
- compatibility with ecologically sustainable use of an area
- education and interpretation
- benefits for conservation, the community and the economy

About a third of Tasmania is protected in forest and marine reserves, 19 National Parks, and a World Heritage Area listed in 1982 and later extended to its current size of 1.38m hectares, which is about 20% of Tasmania. It is no surprise that the State's current ecotourism strength and most of its resources lie in nature-based and related product, including adventure and independent travel.

The importance of the State's natural assets was recognised by pioneers such as Gustav Weindorfer, who first bushwalked in the Cradle Mountain area in 1909 and within 3 years had established a chalet as a base for walkers in what was to become the internationally

significant Cradle Mountain-Lake St Clair National Park.

One of the first to identify the value of ecotourism was Eric Sargent, the founder of one of Australia's first adventure tourism operations. A keen bushwalker, he saw the potential for commercial trekking tours as early as the 1950s but it was 1968 before he was in a position to establish Craclair Tours, taking visitors on expeditions tailored to suit the fragile Tasmanian wilderness.

Tourism initiatives embracing the specific characteristics of ecotourism began to emerge in the mid-1980s with the introduction of a private walking enterprise on the Overland Track in the Cradle Mountain-Lake St Clair National Park. The venture highlighted conservation values and energy efficiency and was a watershed in commercial use of public lands. It has led to other developments, including two East Coast guided walks that feature eco-friendly accommodation.

New operators are beginning to place emphasis on conservation values, such as a Bruny Island tourism venture run by a biologist who has centred her tours around the conservation and scientific values of her property. On the East Coast, a penguin habitat was saved and its penguin population has increased due to the work of a wildlife operator who has given a priority to conservation values as part of developing his business.

In the past five years, a greater range of soft and hard adventure experiences have been developed and the Tasmanian Parks and Wildlife Service has further developed park infrastructure and management capacities. This has included the establishment of major visitor centres at Mt Field National Park, Hastings Caves State Reserve and Freycinet National Park. During the same period, there has been substantial investment in interpretation facilities and services.

The Tahune AirWalk, which features a walkway in the forest canopy and a visitor centre, opened in mid-2001 in the southern forests. It is a prime example of the use of a forest reserve in tourism. It is the first time that Forestry Tasmania has shifted from providing community facilities in its reserves to the establishment of a commercial operation, developed in partnership with the local council and community. The AirWalk has achieved monthly visitation figures of up to 10,000 people.

Mounting interest in nature-based and ecotourism saw Tasmania host the World Congress on Adventure Travel and Ecotourism in 1994, as well as the international Sustainable Wildlife Conference held in conjunction with the World Tourism Convention in 2001.

ECONOMIC VALUE

Tasmania has set two tourism growth targets under its joint industry-State Government business plan, Tourism 21. The targets are \$1,000m in visitor expenditure and 26,000 tourism jobs, both by 2007.

An analysis of potential growth areas has identified potential for Tasmania's ecotourism and nature-based sector to make a substantial contribution to these targets.

The Centre for Regional Economic Analysis in 2000 reported that parks and wildlife tourism alone generates between 3,550 and 4,200 jobs in Tasmania. It is estimated that this sector of tourism accounted for between \$104.8m and \$126.2m in Gross State Product in Tasmania in 1998-99.

A report prepared by Tourism Tasmania, Nature-based Tourism in Tasmania - 1998-99 Update, calculated that 69% of visitors to Tasmania participated in nature-based tourism,

with the figure much higher for international visitors at 86%.

Tasmanian Visitor Survey statistics for 2000-01 show that 83% of all holiday visitors to Tasmania visit at least one National Park, while 53% engage in wildlife viewing. Of those who participate in bushwalking, 52% walk for less than two hours, 29% walk for two hours to a full day and 6% undertake a walk that is overnight or longer.

According to the survey, the most popular natural attractions for holiday visitors in 2000-01 were Cradle Mountain (43%), Lake St Clair/Derwent Bridge (37%), Freycinet National Park (37%) and the Gordon River/Franklin River (33%).

Policy development has stepped up in the past decade and Tasmania was the first State to introduce a whole-of-government approach to managing natural resources, establishing a working party for recreational tourism use of State-owned land. The working party, set up in the early 1990s, assisted with the development of recreational vehicle use in natural areas as well as policies for nature-related State Government agencies.

As a result, Tasmania developed Australia's first integrated plan for walking tracks in 1997, entitled Tasmanian Walking Track Strategy and Marketing Plan. The strategy is helping to ensure that Tasmania remains one of the world's best walking destinations, with its 3,000 kilometres of walking tracks.

The State currently has 1,700 tourism businesses and of the total, about 250 are ecotourism and nature-based operators.

THE FUTURE

Tasmania is in a sound position to advance its nature-based tourism sector, with significant growth in participation by the international market an important trend.

Independent research during the last decade has shown consistently that nature and wilderness are a core element in Tasmania's appeal as a holiday destination. Research also strongly demonstrates that the competitive advantage for Tasmania lies in its blend of nature with the two other prime areas of visitor interest: history and heritage, and food and wine.

To support growth in the ecotourism sector, Tourism Tasmania is currently developing an integrated natural and cultural heritage tourism strategy as a platform for further development of ecotourism and the main elements of visitor experiences offered by the sector.

Areas of potential for the sector include a demand for a wider range of integrated experiences, such as combining rafting and walking, fishing and wildlife, or nature-based activities with food and wine experiences, to provide visitors with a greater breadth of experiences.

Tasmania is likely to see further development of specialised and niche ventures, such as wildlife experiences, as well as new soft and hard adventure products. Other new products are also likely to include opportunities for travellers to participate in environmental research or science projects as part of a holiday.

At the same time, there is a need to ensure that the interpretive aspect of ecotourism products is strengthened, with further investment required in the training of ecoguides to ensure that high-level skills provide visitors with enriching experiences and a greater appreciation of Tasmania's natural values.

The next phase of industry development for the sector will call for active involvement of the industry and its resources in conservation and land management, in partnership with land management agencies.

Continuing recognition of the need to ensure a sustainable approach to development of ecotourism is vital to ensuring that it provides economic, environmental and social outcomes for Tasmania.

Agricultural education - past, present and future (Feature Article)

Feature Article - Agricultural education - past, present and future

Contributed by Professor Rob Clark, University of Tasmania

Over the last 100 years, the face of agriculture in Tasmania has changed from one more characterised by a “way of life” philosophy and a subsistence farming approach to an industry which needs to be internationally competitive and which needs to focus on whole of supply chain issues. In this global market, successful agricultural industries will build on the State’s comparative advantages of abundant natural resources, island status and southern hemisphere position. To capture these opportunities, it is essential that Tasmania develops and invests through education and training, in its richest resource - people.

Increasingly, the skills and the knowledge base required to support agriculture cannot be acquired by experience or from previous generations, since much of the skills and knowledge base is new, technologically sophisticated and rapidly changing. Issues such as food health and safety, training in safe chemical handling, quality assurance, integrated pest and disease management strategies, sustainable resource management, genetically modified plants and animals, greenhouse gases and global warming, a changing business environment and international trade, etc. are all issues at the forefront in agriculture. As a result, the investment in education and training to deliver the science knowledge, business management and the technical skills base required by those engaged in agriculture, to turn our comparative advantages into competitive advantages, is increasingly important.

The outcomes of the national review of agricultural education in Australia (McColl, 1991), along with a Tasmanian review (Lazenby, 1992) and commitment from all stakeholders in Tasmania have all been catalysts to bring about major change in the provision and focus of agricultural and related education and training in Tasmania over the last 5 years. Perhaps the most significant outcome has been the establishment of a network of stakeholders within the Tasmanian Board of Agricultural Education (TBAE). This Board is comprised of representatives from the University of Tasmania, TAFE, Department of Education, Department of Primary Industry, Water and Environment (DPIWE), the Tasmanian Rural Industry Training Board (TRITB), the Tasmanian Farmers and Graziers Association and representatives from agri-industry. Along with the TRITB, the TBAE has overviewed several significant outcomes for agricultural education and training in Tasmania, namely:

- introduction of new 3 year applied science courses in agriculture and horticulture;
- introduction of traineeships, certificates of agriculture, diplomas and vocational education in schools;
- development of articulation pathways between TAFE and the University;

- agreement on a “State Plan” for agricultural and related education and training in Tasmania - with undergraduate agricultural science training focused in Hobart within the School of Agricultural Science and skills training in agriculture based at Burnie within the School of Rural Industries;
- as part of the Tasmanian Institute of Agricultural Research initiative, establishment of research laboratories at Burnie, to focus research into vegetable and dairy industries; and
- introduction of competency based training and national frameworks for vocational education.

In addition to the traditional agricultural education and training, in recent years there has been an increased emphasis on professional development and training using flexible delivery packages. These programs have been delivered by a variety of private and public providers and have been resourced through commonwealth and industry based training schemes.

Despite the increase, both in education and training opportunities available and in participation rates within these programs, there is still concern in agri-industry that the supply of new entrants into education and training programs is not sufficient to meet either current or forecast demands by industry.

Recruitment of new entrants into agriculture remains a challenge. This issue of recruitment of sufficient quality and quantity of new entrants to all levels of education and training within agriculture is recognised locally and nationally as one of the largest impediments to today's agriculture capturing its future potential.

Too often, agriculture is portrayed in a very negative manner and there is failure to promote the scope, diversity and extent of career opportunities that are available to those who have the required skills and knowledge base. Agriculture and the related natural resource management professions will be increasingly looked to when seeking solutions to future management of our food and fibre systems, while managing our natural resources.

The invisible farmers - women in agriculture (Feature Article)

Feature Article - The invisible farmers - women in agriculture

Contributed by Ruth Paterson, Dept of Primary Industries, Water and Environment

Women have always worked the land and helped to provide the food to nourish Australians. Aboriginal women gathered their food as it ripened with the seasons in the annual cycle of migration.

When the Europeans arrived in 1788, the women worked with their husbands or farmed in their own right to develop primary production in Australia and their roles went unacknowledged. Even now, as then, many of these women remain unacknowledged. The traditional perception of an Australian farmer is still that of a tall, bronzed, tough Aussie man in an akubra hat - despite the fact that one third of the rural work force are women.

The lack of recognition for rural women in Australia actually has a historical basis. In the late 19th century, the Australian government felt there was a sense of shame for a developing nation such as Australia to admit the extent of women's involvement in Agriculture. There was a deliberate avoidance of recognising women in agricultural pursuits for fear of creating the impression that women were in the habit of working in the fields as they were in some of the older countries of the world - not something a new and prospering country like Australia wanted to publicise. As a result, the census no longer recorded women's farm work and until 1994, the legal status for farm women was "sleeping partner, non productive."

Australian agriculture can boast a huge range of primary products and food processing industries. Women have always played a part in their development and the rural communities in which they are based. When World War II came, many of Australia's women joined the Land Army and kept the economy afloat.

Responding to needs, often because of hardship and isolation, women have brought innovation to country Australia. The Country Women's Association, formed in NSW in 1922, brought health services to the Australian bush. The School of the Air, established in 1952, and since the late 1980s, the Landcare environmental movement were both developed by women.

Through socialisation, women have tended to accept their role as the invisible farmers.

These stereotypes were especially reinforced by the media through the imagery of advertising and editorial decisions. How often did you see women featuring in glossy rural advertising? How often were women's perspectives put on the front of magazines, rather than being buried down the back in the pink girlie pages? Did these images really reflect modern agriculture? Even though farming is primarily a family business, was the male primary producer the only recipient and user of information and services relating to primary production? This emphasis has generally ignored a customer base - hardly good business ethics.

We went through a period of change when the contribution of farming women began to be publicly recognised. We saw some of the tall and brave poppies being unjustly branded with by-lines like, 'Well who does she think she is! You'd think her husband didn't work on the farm when you read/hear that!'. Thankfully, those reactions are beginning to disappear. It is now commonplace to see and read about farming couples and families - women and men commanding equal recognition for their hard work and expert skills in their own right.

Coinciding with the developing rural women's movement, the Australian Broadcasting Corporation developed the Rural Woman of the Year Award. The Award, which was aimed at raising awareness of the role and contribution of rural women, ran for four years between 1994 and 1997 with approximately 1,200 women involved in some way. It helped highlight, time and time again, the incredible array of skills and talents of rural women.

In an effort to address some of these cultural and social problems, government-sponsored Rural Women's Networks have established themselves since the early 1980s at National, State and local levels. These networks encourage rural women to look beyond their individual context and to identify themselves as part of a much larger group of women. There is also a Federal Government National Action Plan to ensure an increase of women's participation at decision-making levels, to improve the design and delivery of services for all clients and to ensure that women's roles are reflected positively in the media.

Today, more than 70,000 women define themselves as farmers or farm managers. In economic terms, women's contributions amount to at least 28% of the market value of farm output or a gross figure of \$4 billion annually.

Women's main contribution to on-farm output are in the areas of livestock care, value adding, farm tourism and business management. Women also contribute to the overall viability of farming enterprises through off-farm work worth about \$1.1 billion per year.

In recent years, it is off-farm work (81% of which is done by women) which has enabled many farming families to maintain their enterprises and lifestyle through years of prolonged drought and the decline in commodity prices.

As well as contributing to their farming enterprises, women also make essential voluntary contributions to their rural communities. It is estimated that this amounts to at least \$0.5 billion a year in addition to the about \$8 billion a year they contribute to the rural economy through unpaid household work. Yet, with all these skills, women occupy less than 20% of paid management and board of management positions in the agricultural sector. This imbalance reduces the diversity in leadership needed to improve performance, both domestically and in a competitive global market.

If agriculture is to respond to the challenges of the next century, including the opportunities of the global market place, it will need to draw on the diverse talents and perspectives within the sector, particularly those of rural women and young people. As an industry, it can no longer have the men up the front of the hall making the decisions and the women down the back serving the tea and scones.

Australian agriculture can and will benefit from women's perspectives, skills and experiences as it does from those of farm men. It's not about men being less - just women being more.

Agriculture and soils in Tasmania (Feature Article)

Feature Article - Agriculture and soils in Tasmania

FERTILITY

Despite usually having a moderate organic matter content, Tasmanian soils in their native state are not inherently fertile for productive agriculture. Phosphorus and molybdenum are commonly deficient, while soil acidity can limit the growth of some plants. As in most of agricultural Australia, superphosphate has been widely used in Tasmania and, as in many areas with high rainfall and acid soils, molybdenum and lime have periodically been added.

The establishment of improved clover with grass pastures on many soils has increased soil nitrogen. Many soils in Tasmania's agricultural areas are low in potassium, so potash fertilisers are commonly used, particularly where rainfall is high or production and crop removal is intensive (e.g. dairy farming and vegetable cropping).

While initial soil fertility at the time of white settlement is largely unknown, it appears that the majority of soils have probably increased or maintained their fertility since the introduction of the fertiliser and cultural practices just described.

Unlike many other acidic soil areas in Australia, liming has been common in Tasmania, often to increase soil pH above its natural level. Lime is widely available and therefore relatively cheap to transport. Many crops grown in Tasmania respond to lime, including onions, poppies and barley.

STRUCTURE

Some soils, particularly the ferrosols (the red soils of the north-west and north-east, previously known as krasnozems) are of world-class quality because of their free drainage and good structure, but they can be easily degraded by compaction and water erosion.

Areas rated as potentially susceptible to severe soil-structure decline are those primarily used for vegetable cropping. Areas rated as moderate are those used for frequent cropping or forestry operations, and the remainder of the State's private land, which is mainly used for pasture, is shown as having little or no soil structure decline hazard.

SOIL ACIDITY

There are a number of reasons why acidification of Tasmanian soils does not appear to be as rapid as elsewhere in southern Australia. Firstly, Tasmanian soils are already naturally acidic. Secondly, the generally moderate organic-matter in Tasmanian soils buffers them more against pH change. Thirdly, Tasmanian pastures generally contain a perennial grass that helps to restrict the loss of soil nitrate through leaching, a mechanism generally held to contribute to acidification in other parts of Australia.

SALINITY

Apart from the Tamar Valley, King Island and Flinders Island, salinity is restricted to land systems with annual rainfall less than 750 mm and land systems cleared for grazing and infrequent cropping. Confirmed saline areas are therefore less than 1% of the total agricultural area of Tasmania. This is a relatively small problem compared with mainland states such as Victoria, South Australia and Western Australia.

WATER EROSION

There has been no complete assessment of the extent, severity and rate of soil erosion in Tasmania. Areas of concern are:

- the red basalt soils of the north-west;
- the shallow soils on dolerite hills in the Midlands and Derwent Valley, where the north-facing slopes are denuded of vegetation in the summer and are then susceptible to sheet and rill erosion; and
- the soils derived from sandstone and mudstone in south-eastern and northern Tasmania; these have unstable subsoils conducive to both tunnel and gully erosion.

REFERENCE

Sustainable Development Advisory Council, *State of the Environment*, Volume I, DELM 1996

Tasmanian cut flower industry (Feature Article)

Feature Article - Tasmanian cut flower industry

Contributed by the Tasmanian Floricultural Association

Commercial quantities of flowers have been grown for many years in Tasmania. Until fairly recently, the emphasis has been on what are now called 'traditional lines' such as roses, carnations and chrysanthemums.

However, the industry has expanded as increasing numbers of people who had grown flowers for gardening pleasure began to realise how well some types of flowers grew in Tasmania. Also, some people who had traditional farming operations and were looking to diversify also saw flower growing as an opportunity to increase their income. The Flower Industry Association of Tasmania provides a forum for commercial flower growers to promote the industry and to meet and discuss matters of mutual concern.

AREA PLANTED

A survey conducted by the then Department of Agriculture in 1988 indicated that approximately 35 hectares were planted to flowers. By 1992 this had expanded to approximately 107 hectares, an increase of approximately 300% in 4 years.

FLOWERS PRODUCED

The 1960s and 1970s were dominated by the traditional lines of carnations, roses and chrysanthemums but in the 1980s flowers from bulbs and gypsophila became more prominent and proteas and Australian natives also started to be produced. By 1988 proteas and Australian natives as a combined group had the greatest percentage of the area planted followed by narcissus, carnations, other bulbs (mainly gladioli, alstroemeria, and zantedeschia) and gypsophila.

Since that time there has been a significant change in the composition of the types of flowers produced for sale in Tasmania. In 1992 more than half the area of flower plantings was in bulbs, corms and rhizomes, followed by proteaceous plants and Australian natives (20%).

FLOWER PLANTINGS, Tasmania - 1992

Crop	Area (ha)	% of total
Proteaceous plants and Australian natives	21.1	19.7
Bulbs, corms and rhizomes	54.6	51.4
Dried flowers, foliage	4.9	4.6
Fillers (gypsophila, etc.)	7.4	6.9
Traditional lines	18.2	17.0
Total	106.2	100.0

Source: Tasmanian Floricultural Association.

VALUE OF PRODUCTION

It is extremely difficult to make estimates of the value of production on an annual basis for the floriculture industry. This is because there is no central market structure in Tasmania, information on sales volumes and prices is difficult and expensive to collect, and there are direct sales in the industry.

The appropriate basis for comparison of the floriculture industry value with other industries is the farm gate price (the wholesale price less freight and commission).

Studies have concluded that the wholesale value was about \$2 million in 1984-85 rising to about \$5 million in 1987-88. The wholesale value in 1991-92 has been calculated to have risen to about \$11 million.

Approximately 35% of the wholesale price is directed towards commission and freight (commission, 20% and freight, 15%). Hence, the estimated farm gate value of the floriculture industry in Tasmania for 1991-92 is \$7.44 million, a very substantial growth since 1987-88.

FARM GATE VALUE OF FLORICULTURE, Tasmania - 1991-92

Crop	Value (\$m)
Australian natives	0.10
Carnations	0.60
Chrysanthemums	0.60
Fillers	0.63
Freesias	1.10
Iris	0.73
Liliums	0.54
Narcissus	0.46
Proteaceous plants	0.99
Roses	0.37
Tulips	0.80
Other	0.52
Total	7.44

Source: Tasmanian Floricultural Association.

NUMBER OF GROWERS

Prior to 1980 the Tasmanian floriculture industry was relatively small with few growers. In 1984, when the first Department of Agriculture survey was undertaken, it was estimated that there were only 20 growers with more than 200 square metres of flower production. This had risen to 90 in 1987 and 165 in 1988.

While there are no directly comparable figures, it would seem that there has been little change in the number of growers in the past few years: a few have left and these have been replaced by new entrants to the industry.

MARKET OUTLETS

In 1988 it was estimated by the Department of Agriculture that approximately 75% of all flowers grown in Tasmania were directed into the Tasmanian market. Now some 70% of growers send some flowers into mainland markets-most often Sydney, Melbourne and Brisbane-although some flowers are directed to other Australian destinations. Only about 10% of commercial growers direct any flowers to export markets. On the other hand, approximately 20% of commercial growers sell only into the Tasmanian market.

There isn't a centralised wholesale flower market in Tasmania and the distribution of the growers and size of the local market does not lend itself to this form of marketing.

TRENDS IN THE FLOWER INDUSTRY

There has been a major upsurge in the production of Tasmanian cut flowers in the past few years. Perennial gypsophila and freesias have become major crops alongside carnations,

roses and chrysanthemums, while flower bulb crops are gaining in importance and tulip, lillium, nerine and alstroemeria as well as freesia plantings have been established.

Proteaceous plants and Australian natives are presently produced on a small scale; however, there are young plantings that have yet to reach production. Some of these crops include kangaroo paw, Christmas bells, waratah, thryptomene, wax flowers and South African proteas.

Explanatory Notes

Statistics Tasmania (I-Note) - Main Features

ABOUT THIS RELEASE

Statistics - Tasmania is a statistical snapshot of Tasmania and Tasmanians. It brings together a range of ABS and non-ABS data to provide economic, social and demographic indicators for Tasmania. Included are indicators on population, labour force, education, crime, health, agriculture, housing and construction, transport, income and tourism. Commentary and feature articles complement the statistical data presented.

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